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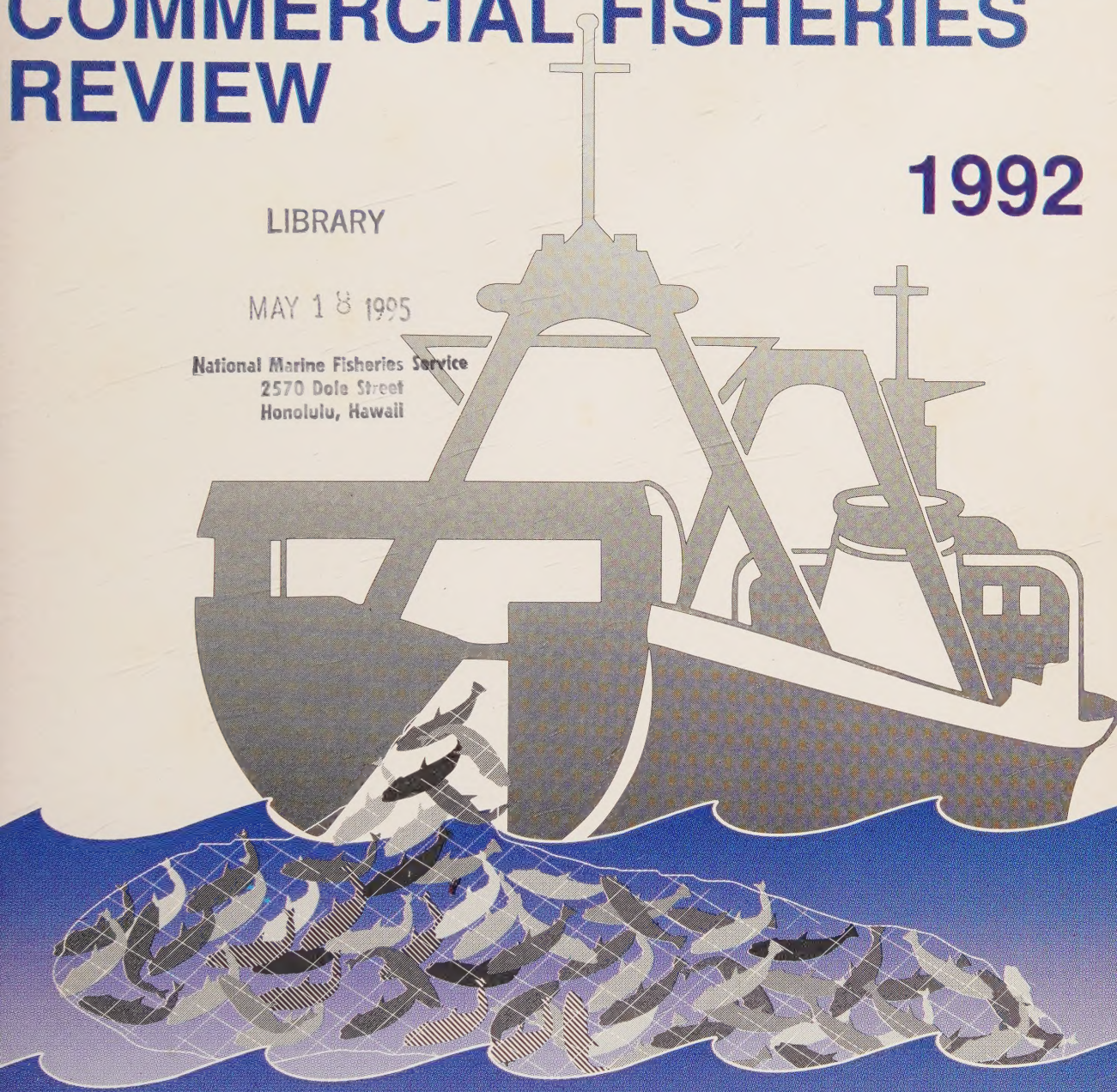

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CHIEF DIRECTORATE SEA FISHERIES
DEPARTMENT OF ENVIRONMENT AFFAIRS
SOUTH AFRICA

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Republic of South Africa
Department of Environment Affairs
CHIEF DIRECTORATE SEA FISHERIES

SOUTH AFRICAN COMMERCIAL FISHERIES REVIEW 1992

2

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The text was compiled by the editor from contributions by the relevant Subdirectorates and Divisions of the Sea Fisheries Research Institute and the Subdirectorate Resource Management of the Chief Directorate Sea Fisheries.

MISSION OF THE CHIEF DIRECTORATE SEA FISHERIES

To ensure effective protection and sustainable use of the living resources and ecosystems of the sea around the Republic of South Africa, the Chief Directorate Sea Fisheries of the Department of Environment Affairs undertakes and supports applicable research in order to provide the best possible advice on resource utilization and protection

- *maintains effective administration of sea fisheries matters, and*
- *promotes sea fisheries development and policy in consultation with interest groups.*

EDITORIAL NOTE

This series, South African Commercial Fisheries Review, *and its companion series*, Research Highlights of the Sea Fisheries Research Institute, South Africa, *have replaced the series* Annual Report of the Chief Directorate Sea Fisheries *and its predecessors. However, the missing numbers of the defunct series are currently under preparation to complete the time-series.*

This Review aims to present the official statistics on the catches, production and monitoring of the South African commercial marine fisheries and to document changes in exploited stocks, in fishing, processing and marketing practices and in fisheries management and legislative measures. More detailed treatment of specific aspects can be found in the research series of the Sea Fisheries Research Institute and the international scientific literature.

1. INTRODUCTION

THE statutory Quota Board, instituted in terms of the Sea Fishery Act (No. 12 of 1988 as published on 1 July 1990), became fully operational in 1991. For the first time fishing quotas are now allocated by an independent body and not by a political functionary. In terms of the Sea Fishery Amendment Act (No. 57 of 1992) the powers of the board were enhanced by transferring the authorization of quota transfers and the issuing of exploitation rights from the Minister of Environment Affairs to the Board. However, the determination of Total Allowable Catches (*TACs*) remains the function of the Minister.

The Sea Fishery Regulations were extensively revised and published in full on 23 October 1992. A completely revised management structure for linefish was *inter alia* provided for, in essence permitting commercial and recreational linefishing according to the state of each linefish species. Access to resources is restricted by varying bag limits depending on the listing of a species as critical, restricted, exploitable, recreational or bait.

As provided for in the Sea Fishery Act of 1988, formal bodies representing most of the major sectors of the fishing industry were recognized in 1992. These bodies are consulted on all resource management matters concerning their respective sectors.

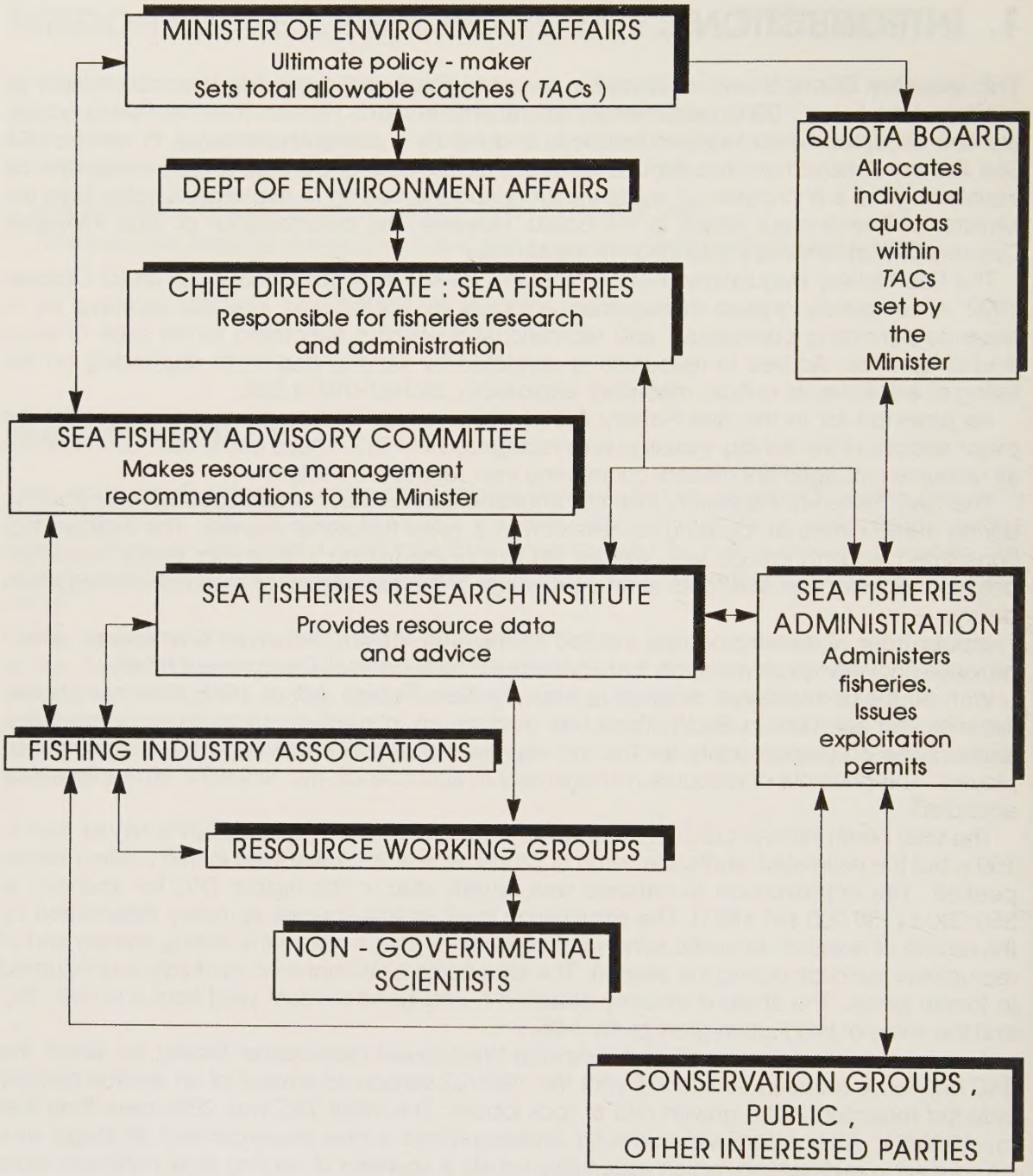
The Sea Fisheries Research Institute implemented a major organizational restructuring during 1992, aimed at focusing its research in a more functional manner. The Institute has constituted working groups with various sectors of the fishing industry for direct interaction between industry and scientists at an early stage of the formulation of resource management policy.

Inputs from all these sources are fed to the Sea Fishery Advisory Committee, which provides final advice on resource management to the Minister of Environment Affairs.

With all these structures emanating from the Sea Fishery Act of 1988 now operational, fisheries management in South Africa has become an interactive, consultative process that encourages co-responsibility for the management of marine resources by all active role-players. The principle of resource management in accordance with scientific advice is widely accepted.

The total South African catch in 1992 was the third best since 1975 and 37% higher than in 1991, but the estimated wholesale value of products was 9% lower than in 1991, when values peaked. The improvement in catches was largely due to the higher *TAC* for anchovy of 350 000 t (150 000 t in 1991). The exploitation level for this species is mainly determined by the results of research acoustic surveys of spawner biomass before the fishing season and of recruitment success during the season. The tuna catch also improved markedly and returned to former levels. The abalone industry obtained a very good product yield from a similar *TAC* and the value of production grew by by 14%.

A serious cause for concern has been the West Coast rock-lobster fishery, for which the *TAC* had to be reduced substantially for the 1991/92 season as a result of an environmentally induced reduction in the growth rate of rock lobster. The initial *TAC* was 28% lower than that for 1990/91. After intensive scientific investigations a new management strategy was introduced in mid-season, which essentially entails a scenario of varying legal minimum sizes coupled to correspondingly varying levels of *TAC*. The *TAC* was reduced from 2 715 t at a minimum carapace length of 89 mm to 2 200 t at a minimum carapace length of 75 mm. This strategy is a major departure from the fixed minimum size restriction that had been in place


MINISTER OF ENVIRONMENT AFFAIRS
Ultimate policy - maker
Sets total allowable catches (TACs)
DEPT OF ENVIRONMENT AFFAIRS
CHIEF DIRECTORATE : SEA FISHERIES
Responsible for fisheries research and administration
QUOTA BOARD
Allocates individual quotas within TACs set by the Minister
SEA FISHERY ADVISORY COMMITTEE
Makes resource management recommendations to the Minister
SEA FISHERIES RESEARCH INSTITUTE
Provides resource data and advice
SEA FISHERIES ADMINISTRATION
Administers fisheries.
Issues exploitation permits
FISHING INDUSTRY ASSOCIATIONS
RESOURCE WORKING GROUPS
NON - GOVERNMENTAL SCIENTISTS
CONSERVATION GROUPS , PUBLIC , OTHER INTERESTED PARTIES

Organigram of structures emanating from the Sea Fishery Act of 1988 to manage the marine resources of South Africa

for some thirty years. This lower allocation was caught but led to hardship for fishing communities on the West Coast and lower export earnings. Marketing conditions for this luxury item were also not good because of the state of the economy in the importing countries. After the good performance of the jigging fishery for squid on the Cape south-east coast in 1991, the catch this year was the lowest it has ever been except for the inception years (1983 and 1984) of the fishery. However, South African and world catches of squid are prone to fluctuations and our stock have been more stable than most. The lower yield of this high-value product has affected the industry sector and export earnings substantially.

The most valuable fishery sector, the demersal, sustained catches, but the value of products declined by 19,5% The net result was that the potential value of the South African fishing industry was estimated to have been 9,4% lower than in 1991.

* * *

2. THE FISHERY AS A WHOLE

2.1 Total catch

SOUTH AFRICA made a total commercial catch of 715 228 t in 1992 (Table I), 37% more than in 1991. The country therefore maintained its status as one of a group of 22 medium-sized fishing countries that have caught between half a million and one million tons annually during the period 1975–1991.

With the exception of the years 1987 and 1988, when the total South African catch was in the region of 950 000 t, it has fluctuated between 556 000 and 685 000 t from 1975 to 1990. The catch of 521 067 t in 1991 was therefore the lowest recorded since 1975, but the 715 228 t of 1992 was the third highest. Catches are dominated by the two largest fishery sectors, the demersal and the pelagic, which between them have accounted for 87–95% of the total reported catch in the years 1975–1992, 94% in 1992.

The demersal fishery is the more stable and is dominated by the hake catch, which is regulated by quota. After the South African demersal catch had peaked at 220 000 t in 1979 after the declaration of a fishing zone of 200 nautical miles in November 1977, conservative hake quotas were allocated from the early 1980s to build up the stocks depleted by foreign distant-water fleets. From a low of 180 000 t in 1983 there has been a steady rise in the demersal catch to 243 530 t in 1990, but the catches of 222 293 t in 1991 and 218 270 t in 1992 (Table I) were more in line with that of 1989 (221 806 t) although the hake quotas have actually been rising.

The pelagic fishery is traditionally the largest contributor to the total catch. It has been remarkably stable considering the fluctuating nature of pelagic stocks, mainly because catches have been restricted by an overall (multispecies) quota during the period 1971–1982 and individual quotas for anchovy and pilchard since 1983. Pelagic catches fluctuated between 349 000 and 409 000 t in the period 1975–1991, except in the years 1987 and 1988 when they averaged 675 500 t, and 1990 and 1991 when they dropped to the lowest level

Table I: Total nominal catch and catch per sector of the South African commercial sea fisheries (landings in Walvis Bay and Moçambique excluded)

Fishery sector	Nominal catch (t)	
	1991 1990/91	1992 1991/92
Seaweeds (wet weight)	16 802*	15 178
Bait organisms	3	1
Mussels and oysters farmed/ fattened	2 267*	2 440
Picked oysters and marketable wash-ups	66*	65
Abalone	567	587
Whelks and crabs	2	2
Limpets	–	0,4
Rock-lobster fisheries		
West Coast	2 996	2 483
South Coast	946	934
Subtotal rock lobster	3 942	3 417
Crustacean trawl	700	590
Pelagic fisheries	249 162	452 705
Line fisheries		
Tuna	2 873*	5 215
Squid jigging	6 624*	2 588
Handline fishery	13 834*	12 455
Subtotal line-fish	23 334*	20 258
Harder and St Joseph fishery	1 412	1 193
Demersal fisheries		
Offshore		184 855
Inshore		17 849
Midwater		10 772
West Coast sole		338
West Coast gurnard		81
Offal (trash fish)		4 381
Subtotal demersal	222 293	218 276
Guano	520	515
Total	521 067*	715 227

* Updated

since 1958 at some 250 000 t. The catch in 1992 of 453 000 t (Table I), however, was the third best, marginally better than the 451 400 t in 1973. Anchovy has been the single most important species in the pelagic catch since 1966. On the results of research acoustic surveys the anchovy quota was doubled to 600 000 t in 1987 and 1988 but afterwards cut, to 150 000 t in 1991, resulting in the lowest anchovy catch since 1969. Surveys permitted a higher anchovy *TAC* of 350 000 t for 1992.

Besides the pelagic fishery only mussel farming, tuna pole fishing and abalone diving improved on their performance of 1991 (Table I). All other sectors yielded less, a particularly serious situation in the valuable fisheries for West Coast rock lobster and chokka squid.

More details are given elsewhere in this review, in the companion publication, *Research Highlights* **2**, and in previous *Annual Reports of the Chief Directorate Sea Fisheries*.

2.2 The information base

THE catch figures presented are in the main quite accurate, being a summation of the monthly landings reported by each company in each fisheries sector, a statutory requirement. In the fisheries controlled by quota, landings usually pass over scales that in some cases are controlled by Fisheries Control Officers of the Cape Provincial Administration. For some fisheries in which the catch is not always landed in the whole (round) state, particularly the demersal fisheries, landings have been converted to nominal catch by the use of scientifically determined conversion factors based on the degree of processing carried out on board by the various fishing concerns. For some smaller fisheries for which numbers only are reported (e.g. the mullet and oyster sectors), a conversion to mass has been made by use of the best available information.

The monetary values presented in Table II are more of an estimate, not being based on a summation of sales of various commodities by companies throughout the year but rather on average prices realized as provided by companies consulted in this regard. However, the production figures presented throughout this report and which form one component in calculating values are regarded as mostly quite accurate. The problem arising from a great variety of product lines produced by different companies is particularly acute in the demersal sector, the most valuable of them all.

The value at landing or at first sale is also problematical in those fisheries where the landed fish is either not caught by independent fishermen or not sold to a second party. Because of vertical integration in some fishery sectors and the provision of fuel and gear to fishermen, value at landing is often simply calculated for accounting purposes.

2.3 Monetary value of catches and products

VALUES at landing in 1992 are not given for the demersal fisheries because of the prevalence of vertical integration in them. They will in future only be provided for those fisheries where a first selling to an independent buyer is involved and normal market forces operate. The following discussion is therefore limited to the next step in the production and distribution chain, namely wholesale value. This value represents the estimated potential value of production on the assumption that all of it was sold at reigning prices.

For the first time since the commencement of the present data series in 1986 the total value of the products of the South African fishing industry has dipped. The total in 1992 was 9%

lower than in 1991 (Table II), the peak year, but at R1 186 million was still double the estimated R579 million in 1986. Annual gains had been 20–30% from 1986 to 1989, but more moderate therafter up to 1991. These values were attained from total catches that peaked in 1988 at some 950 000 t and then declined steadily to 512 000 t in 1991. The catch in 1992 was 37% higher than in 1991 at 715 000 t (Table I).

The key to understanding this situation lies in the relative values of the products of the various sectors and the fluctuating nature of some, particularly the low-value pelagic fishery. The largest fishery in terms of landings, the pelagic, has one of the lowest values of products in relation to tonnage landed, namely R285–R746 per ton in the period 1986–1992. The main products of this fishery are fish meal, fish oil and canned fish. Whereas the production of fish meal follows the trend in catches, that of fish oil depends on the condition of the fish, and canned production is limited by the capacity of the canneries, demand for anchovy pet food, the modest pilchard quota and the number of boats with cooling facilities. The result of this

Table II: Estimated values of landings and products of the various South African commercial fisheries (Walvis Bay and Moçambique excluded*)

Fishery sector	Value (R million)			
	Landed 1st sale		F.O.B. wholesale (processed)	
	1991	1992	1991	1992
Seaweeds	3,853†	2,200	6,904	3,730
Mussels and oysters farmed	15,661		22,373	12,470
Oysters collected	0,298	0,298	0,691	0,691
Abalone	7,321	7,230	23,528	26,847
Rock-lobster fisheries				
West Coast	74,875	49,660	102,216	89,022
South Coast	34,704	39,040	49,305	45,900
Subtotal rock lobster	109,579	88,700	151,521	134,922
Crustacean trawl*	11,745†	10,412	13,271	12,095
Pelagic fishery (bait included)	49,213	90,216	185,810	262,576
Linefisheries				
Tuna pole fishery	16,654	33,901	19,653	40,072
Squid-jigging	53,236	11,646	75,156	24,586
Handline fishery	38,961	39,101	51,740	57,401
Subtotal linefish	108,851	84,648	146,549	122,059
Mullet and St Joseph fishery	1,430	1,298	3,410	2,089
Demersal fisheries				
Offshore	215,439		670,130	544,044
Inshore	23,397		59,531	51,110
Midwater trawl	11,997		25,868	13,377
Subtotal demersal fish	250,833		755,529	608,531
Guano	0,312†	0,335	0,390†	0,446
Total	559,096†		1 309,976†	1 186,456

* Excludes catches made off Moçambique
† Updated
N.B. R1 = ± $(U.S.) × 0,28 in mid 1994

product mix is that the rand yield per ton of pelagic fish is better for low than high catches in spite of product prices rising year by year. The general dampening effect that the pelagic fishery with its low-value products has on the value of the fishing industry as a whole is therefore ameliorated in years of poor pelagic catches by the factors discussed above.

The pelagic fishery is only second most important in terms of value and has contributed between 14 (in the years of poor catches) and 27% (in the years of good catches) to the overall valuation. Trends in the realization per ton landed in that fishery will therefore have a minor effect compared to trends in the demersal fisheries, the most valuable ones that have contributed between 48% (in the years of good pelagic catches) and 57% (in the years of poor pelagic catches) to the overall valuation of the fishery industry. Their contribution in 1992 was 51,3%. The wholesale value of demersal fish and products and of the value per ton doubled in the period 1986–1992, which is a reflection of rising prices and a more stable product mix than obtains in the pelagic fishery. This occurred against the background of a consistent, moderate increase in landings of 28% from 1986 to 1990. However, landings of demersal fish in 1991 dropped by 9,4% and in 1992 by a further 1,8%. The lower catch of 1991 was counteracted by higher prices so that the value rose by 11%, but in 1992 the effect of the even lower catch was aggravated by lower prices so that the value dropped by 19,5% — the total was even lower than in 1990.

The decrease in the value of the demersal fisheries from 1991 to 1992 amounted to R147 million, but the overall value of the fishing industry declined by only R124 million (Table II). Because of higher landings (Table I), the pelagic fishery bettered its potential earnings from sales by R77 million but not to the extent higher landings would have led one to expect on account of the nature of that fishery discussed earlier. The tuna pole fishery doubled its potential earnings with a gain in value of R20 million (Table II), not only because of a return to previous levels of catches but also because of higher prices, as reflected in a value of R7 680 for products per ton landed as opposed to R6 890 in 1991. The products of the small abalone industry have fetched increasingly high prices over the period under discussion (value of products per ton received has risen fourfold). The rise was sustained in 1992, potential values increasing by R3 million since 1991 (Table II). This export-driven industry has become the best earner per ton of raw product landed at some R43 616 in 1991–1992. The value of the handline fishery improved by R5,7 million (11%) over 1991 on a catch 10% lower. On the credit side, all these fisheries that enhanced their valuation accounted for an improvement of R106,2 million over 1991.

On the debit side, virtually all other fisheries were valued lower in 1992, caused by lower landings/production or lower prices or both. The drop in the potential earnings of the demersal fisheries has already been discussed. The squid-jigging fishery had a poor year, landings being 61% lower and value of products 67%. Although prices clearly also dropped from the record levels of 1991, this fishery remains one of the highest earners per ton of raw product landed, at more than R10 000. Despite a steady rise in the production of cultured oysters and mussels since 1986, prices obtained have dropped in the past two years and the total value has actually decreased for the first time in 1992, by 44% (R9,9 million) on 1991.

Since the 1989/90 season the fishery for West Coast rock lobster has not been able to fill its *TAC*, even with a severely cut *TAC* in 1991/92. The reasons for the dearth of animals of legal size are discussed elsewhere in this review and its companion publication *Research Highlights*. The potential wholesale value of products peaked in 1990, was marginally lower (2%) in 1991

Table III: Licensed South African commercial fishing vessels in the fisheries zone of the Republic (1 July to 30 June) as at 10 May 1993

Registration area	Registration letters	≤ 4,99 m		5 – 7,99 m		8 – 11,99 m		12 – 19,99 m		> 20 m		Regional totals	
		1991	1992	1991	1992	1991	1992	1991	1992	1991	1992	1991	1992
Walvis Bay	WB	4	5	5	12	–	–	–	–	1	1	10	18
Port Nolloth	PNA	125	130	–	–	1	1	7	8	–	–	133	139
Hondeklip Bay	HB	42	42	–	–	–	–	4	4	–	–	46	46
Vredendal District (including Doring Bay)	VR	114	115	1	1	1	1	7	8	–	–	123	125
Lambert's Bay	ADF	200	197	19	19	33	33	10	10	11	9	273	268
Piketberg District (including Elands Bay and Velddrif)	PQ	310	318	39	40	4	4	2	2	14	15	369	379
Saldanha Bay area	SBH	179	182	63	63	10	9	7	8	42	37	301	299
Vredenburg District (including Paternoster and St Helena Bay)	SH	311	318	52	54	26	26	20	19	26	27	435	444
Table Bay area (including Bok Bay and Yzerfontein)	CT	68	71	148	149	–	–	–	–	–	–	216	220
Cape Town Harbour	CTA	–	–	–	–	5	5	73	73	87	93	165	171
Hout Bay	HTB	7	7	8	9	14	15	77	76	18	23	124	130
Simonstown Harbour	STH	2	2	6	6	9	9	4	4	–	–	21	21
Simonstown area (including Cape Point and False Bay areas)	ST	117	121	146	156	1	2	–	–	–	–	264	279
Kalk Bay	KB	4	4	20	21	35	35	10	10	–	–	69	70
Somerset West District (including Gordon's Bay)	SW	48	55	124	132	9	5	3	3	–	–	184	195
Caledon and Hermanus Districts (including Hawston)	C	70	71	35	44	–	–	2	2	2	1	109	118
Gans Bay (including Klein Bay and Pearly Beach)	DDF	72	65	46	46	–	–	4	4	8	7	130	122
Bredasdorp District (including Waenhuiskrans and Struis Bay)	BR	38	40	113	120	22	22	–	–	–	–	173	182
Heidelberg District (including Witsand and Infanta)	SM	7	7	19	19	–	–	–	–	–	–	26	26
Riversdale District (including Still Bay and Puntjie)	R	29	33	76	84	1	1	–	–	–	–	106	118
Mossel Bay	MBA	–	–	5	8	10	10	6	6	23	23	44	47
George District	G	2	3	6	7	–	–	–	–	–	–	8	10
Knysna District (including Plettenberg Bay)	KN	3	3	24	25	1	1	2	3	–	–	30	33
Humansdorp District (including Jeffreys Bay and Oyster Bay)	H	5	5	132	116	13	14	11	10	–	–	161	145
Port Elizabeth area	PEA	2	2	21	30	11	12	48	48	15	15	97	107
Port Alfred District	P	2	2	74	83	3	3	1	1	–	–	80	90
East London area	ELA	1	1	23	21	1	2	1	1	–	–	26	25
Durban area	DNA	–	–	2	5	8	9	6	7	16	17	32	38
Natal coast	N	8	8	146	166	5	4	–	–	–	–	159	187
Total		1 770	1 770	1 353	1 436	223	223	305	307	263	268	3 914	4 052

and decreased further by 13% in 1992. Although prices obtained rose throughout the period 1986–1992, they could not compensate for lower landings in the past two years. The fishery for South Coast lobster has remained stable, so that the combined value for the rock-lobster fisheries only decreased in 1992, by 11%. However, these fisheries remain the third most valuable at 11,4% of the total value for all fisheries, marginally ahead of the linefisheries, at 10,3% in 1992. In terms of value of products per ton landed lobster fisheries now rank second after abalone, at some R39 500.

The total decrease reported by the four major fishery sectors that fared poorly in 1992 amounted to some R224 million. If the improvement of R106 million reported by those fishery sectors that had a better year is discounted against this amount, the R124 million lower total wholesale value for 1992 in comparison with 1991 is largely accounted for.

The indications from the crude calculation of value of products per ton landed that prices obtained in 1992 were either lower or stagnant in many fishery sectors leads to the impression that marketing conditions were deteriorating. This particularly applies to export-orientated luxury items such as squid, rock lobster, prawns and mariculture products, but also to the hake-dominated demersal fisheries, which export considerable quantities. The state of the economy, locally and in the importing countries, would have some bearing on this. The exception is the abalone industry, which has reported outstanding results from a near-constant catch. The overall wholesale value of products per ton of raw material landed for all fishery sectors declined by one-third, to R1 656 since 1991.

2.4 The South African commercial fishing fleet

A NEW computerized licensing system was introduced in 1990, so permitting direct comparison of three licensing years. Commercial fishing vessels are now required to renew their licences annually (1 July–30 June) and pay according to five length categories. Additionally, some (52 in the calendar year 1990, 33 in 1991 and 56 in 1992) were licensed as factories. However, licensing does not confer the right to fish, and permits must be bought for each fishery sector in which the vessel is an approved participant. Only the permits for the various linefisheries, the purse-seine fishery and Natal crustacean trawling have as yet been entered on computer. Details of such permits will be given under the relevant fisheries in this review.

The present discussion is confined to the numbers of craft of the various size categories licensed along the coast (Table III). Registration areas are best to be regarded as home ports because, for instance, most trap-fishers for South Coast rock lobster are registered in Cape Town and Hout Bay. The computer reconstruction is accurate as far as licences are concerned, but gives the registration area as at the later date when the summary was made so that area transfers are to a certain extent masked. That a boat is licensed and presumably has obtained a permit for a fishery does not mean that it fished for the entire year or at all. More information on fleets actually fishing are given later in the reviews of some fishery sectors.

The overall fleet grew slightly by 1,5% in 1991 to 3 941 vessels and by a further 3,5% in 1992 to 4 052 vessels (Table III). These have been the first gains since 1969 when the fleet peaked at 7 816, and the present fleet is therefore about half that total.

The expansion in 1991 had been due solely to 4,7% more vessels in the length category 5–7,99 m being licensed, because the other categories remained stable or contracted marginally, but that in 1992 could be ascribed to more vessels, not only in that category but

also in the smallest, that of craft less than 5 m in length (Table III). If the category 5–7,99 m is roughly equated with the skiboat and motor skiboat group used for licensing up to 1989, the trend is consistent in that this was the only group to have expanded year by year, from 858 craft in 1980 to 1 450 in 1988 (an overall increase of 69%). All other categories had contracted more or less consistently since 1980, the most significant one being the smallest one — that of dinghies, for which a drop of 57% was recorded from 3 774 in 1980 to 1 636 in 1989. The numbers of 1 768, 1 770 and 1 818 in 1990, 1991 and 1992 in the current smallest category of ≤4,99 m are roughly in line with this. The main contributor has been the loss of dinghies in the West Coast rock-lobster fishery. The gain since 1991 in the number of craft smaller than 5 m, dinghies and some smaller skiboats, took place all along the coast except at Gans Bay (DDF) were there were 65 of the smallest craft in 1992 and 69 in 1990. However, in most cases the increases in 1992 merely represent a return (sometimes partially) to numbers in 1990. The only areas to show a substantial gain in 1992 on 1990 in numbers of craft smaller than 5 m were Piketberg District (PQ), Somerset West District (SW), Riversdale District (R) and Natal Coast (N).

The greater number of craft in the two smallest length categories at first sight seems anomalous because they are used for handline fishing, squid jigging, hoopnet fishing for West coast rock lobster, beach netting and abalone diving — all fisheries to which new entrants are not allowed. The number of rock-lobster dinghies may vary depending on fishing circumstances and beach-netters may or may not use a dinghy or even one not specifically permitted for that fishery or licensed at all, the so-called N-permits for dinghies having fallen away. However, the number of craft smaller than 5 m on the West Coast down to Kalk Bay where these activities mainly take place only increased from 1 489 in 1990 to 1 512 in 1992 and the gain in the next larger category was even less, from 506 in 1990 to 518 in 1992. Abalone divers may use up to two vessels each, but there are only some 50 of them. On the coast to the east of that (SW to N) the main activities affecting small craft are handline fishing and squid jigging. Numbers of craft smaller than 5 m rose from 279 in 1990 to 306 in 1992, similar to the rise to the west of that, but the number of boats 5–7,99 m in length showed a more substantial increase, from 782 in 1990 to 906 in 1992. Permits have been transferable under the new Sea Fishery Act since July 1990 and are not coupled to a specific vessel so that the same number of crew may now be employed on two smaller vessels or the crews of two smaller vessels combined on one larger vessel, the size of the crew being the main instrument to control fishing effort. The inescapable conclusion from the gain in numbers of craft in the two smallest length categories is that the former option has predominantly been exercised, namely to allocate the crew of a larger vessel to smaller craft. The accelerated trend from 1991 to 1992 seems to be related to poor chokka squid catches in 1992 and a shift to handline fishing (all squid-jiggers are required also to hold a linefish permit).

If the trends in vessel numbers are examined on the basis of registration areas, 5 areas showed a loss from 1991 to 1992, 3 were unchanged and 21 gained. The preponderance of registration areas showing a gain in vessel numbers from 1991 to 1992, namely 21 out of 29 (16 from 1990 to 1991) is in line with the growth in overall numbers from 1990 to 1992 and shows that increases took place over a larger part of the coastline in 1992 than in 1991 when they were mainly confined to the coast east of False Bay.

The areas where there were fewer boats in 1992 than in 1990 were SBH, ELA, DDF, STH, SH, CT and KB. On the coast west of Cape Point the only consistent gains were at PQ, where

there were 19 more vessels, mostly dinghies, and HTB, where there were 9 more of all categories in 1992 than in 1990. There were more vessels in each of the registration areas east of False Bay in 1992 than in 1990 (except at ELA mentioned before) and the increase has been consistent in all except Mossel Bay (MBA) and H. In the remaining areas the gains over the period 1990–1992 have been consistent and substantial, particularly to the east of H – 46 at PEA and P combined and 54 in Natal (DNA and N). Squid jigging, for which most vessels are registered in H, was particularly poor in 1992 (see relevant section), leading to a switch to handline fishing. The pressure this was putting on the limited linefish stocks off Natal prompted a moratorium in mid 1992 on the transfer of linefishing vessels from the Cape Province to Natal as a permit condition.

* * *

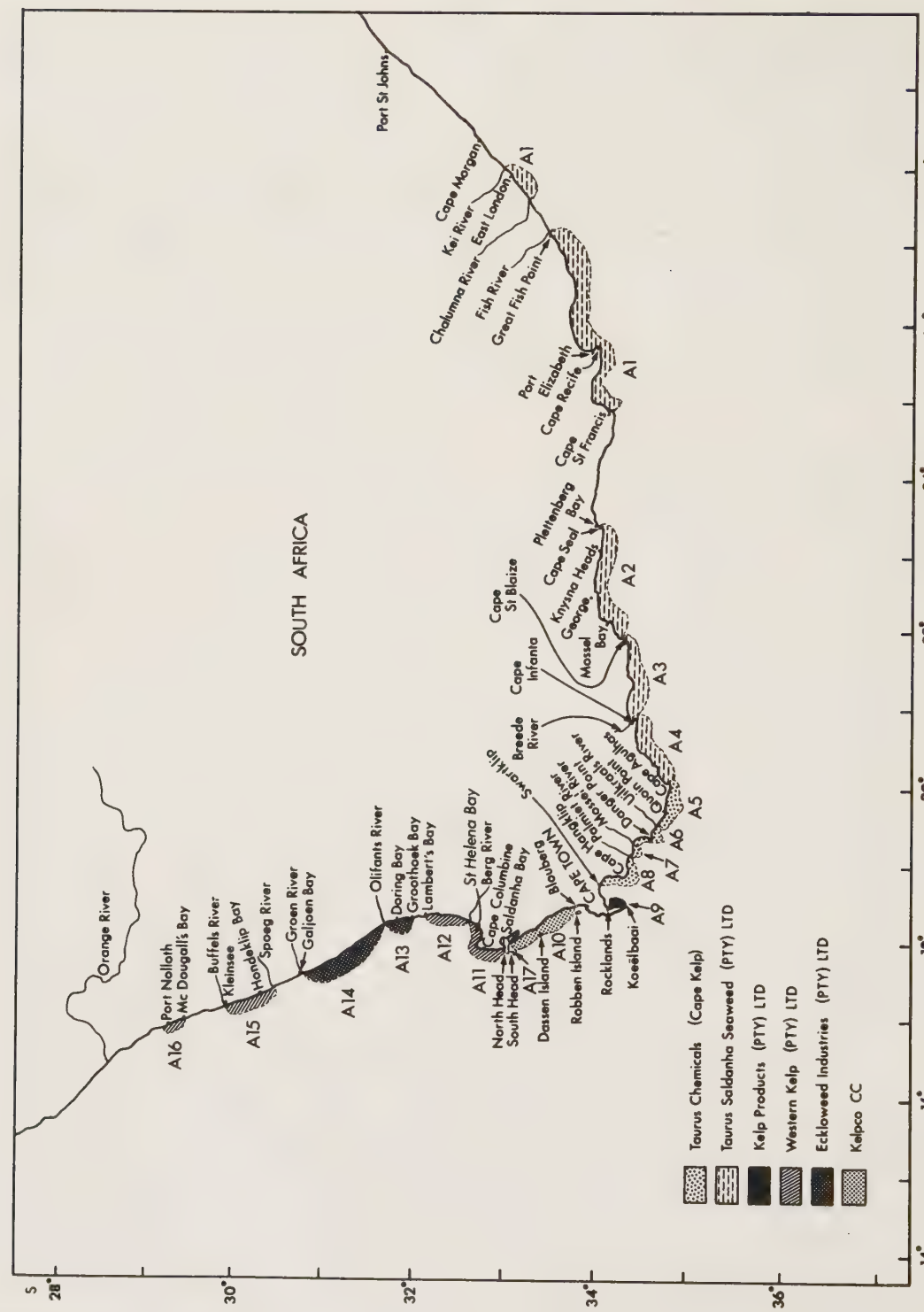


Fig. 1: The Cape coast is divided into 17 Concession Areas for the control of commercial seaweed exploitation. Exclusions are restricted areas (e.g. diamond areas and nature reserves)

3. FISHERY SECTORS

3.1 Seaweeds

THE few species of South African seaweed that are commercially exploited are found in Cape waters. Control over their collection resides in the Department of Environment Affairs, which grants concessions for the 17 areas into which the coast has been divided (Figure 1). Concessionaires pay an annual fee and a nominal levy on the amount of seaweed collected. Two types of permit are obtainable: one giving the right to harvest or collect, and the other allowing only experimental harvesting subject to scientific research by the Sea Fisheries Research Institute.

Beach-cast kelp is collected in most concession areas west of Cape Agulhas, and the bulk is exported for the extraction of alginates. World markets for kelp remained poor in 1992, and less than 1 500 t of raw material were collected, representing a drop of 25% since the previous year (Table IV).

Kelp continues to be harvested at Soetwater, near Kommetjie (Concession Area 9), for the production of an agricultural growth stimulant. Experimental harvesting at Danger Point was started in 1992 for the feeding of artificially cultured abalone. Kelp yields were insignificant because the culturing activities are at present only on a pilot scale, but they are expected to expand in the near future.

The agar-producing red seaweed *Gracilaria verrucosa* provided a pleasant surprise for the Saldanha Bay concessionnaire in February 1992, when beach-casts began coming ashore for

Table IV: Seaweeds gathered and exported

Concession area (C.A.)	Kelp: Mixed *Ecklonia maxima* and *Laminaria* spp.		*Gelidium* spp.		*Gracilaria verrucosa*		Total	
	1991	1992	1991	1992	1991	1992	1991	1992
				Gathered (kg dry mass)				
1	–	–	100 881	91 834	–	–	100 881	91 834
2–4	–	–	–	1 860	–	–	–	1 860
5–8	596 694	260 894	–	–	–	–	596 694	260 894
9	–	421	–	–	–	–	–	421
10	–	–	–	–	–	–	–	–
11	29 400	–	–	–	–	–	29 400	–
12	37 700	–	–	–	–	86 200	37 700	86 200
13–14	518 896	345 071	–	–	–	–	518 896	345 071
15	523 950	521 440	–	–	–	–	523 950	521 440
16	264 766	364 800	–	–	–	–	264 766	364 800
17	–	–	–	–	–	191 305	–	191 305
Total	1 971 406*	1 492 626†	100 881	93 694	–	277 505	2 072 287*	1 863 825†
				Exported (tons dry mass)				
Total	2 032	1 397	117	99	–	198	2 047	1 694

* Excludes 223 759 kg wet mass (dry mass *c.* 33 606 kg if 15% moisture assumed) of harvested kelp in Area 9
† Excludes 267 780 kg wet mass (dry mass *c.* 40 167 kg if 15% moisture assumed) of harvested kelp in Area 9

Large quantitites of the red seaweed *Gracilaria* are once again coming ashore at Saldanha Bay, after the collapse of this resource in 1989. The seaweed is loaded onto trailers, spread on fields to dry, then sorted and baled for export.

the first time in three years. Consistent yields have been obtained since and the resource seems healthy again (Table IV). The Saldanha Bay population of this seaweed has collapsed several times in the last two decades for reasons that are not yet clear but are the subject of current research. Small casts of *Gracilaria* were obtained in St Helena Bay. The world market for *Gracilaria* remains depressed following flooding with Chilean supplies and, although sales prospects are in general rather bleak at the moment, South Korea has lifted trade sanctions with South Africa and is providing a market for some of the local material.

Several *Gelidium* species are harvested on the coast of the eastern Cape (mainly in Concession Area 1) and, because they produce high-quality agars, continue to find ready markets (Table IV). About 80% of the annual harvest is composed of the most valuable species, *Gelidium pristoides*.

3.2 Hard corals

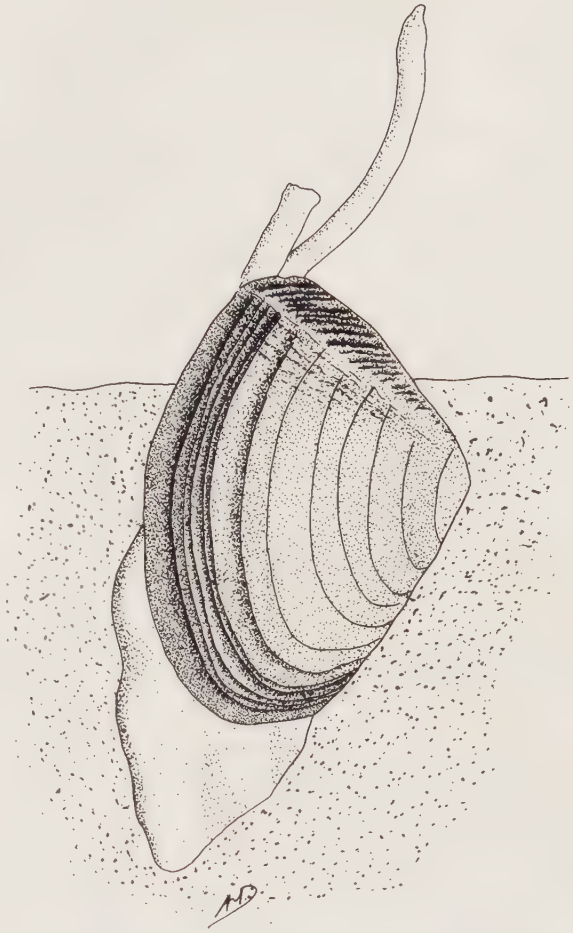
THE experimental permit to harvest 1 000 kg of *Allopora* spp. from Struis Bay to Quoin Point at depths greater than 20 m was not renewed in 1992 and has lapsed. The *Allopora* landings for 1991 amounted to 382 kg. A permit for another harvester will be issued for 1993.

3.3 Bait organisms

THREE new permits were issued for the collection of white mussel *Donax serra* on the West Coast for bait purposes, bringing the total to four permits. The three new permits were for the Elands Bay area, the existing permit being for the Dwarskersbos area. In consequence, total collection increased to 20 145 for 1992, compared with 10 400 for 1991.

Of the sand clam *Mactra glabrata* 36 kg was collected for bait, compared with 20 kg in 1991.

In 1992 a permit was issued to an abalone canning factory in Hermanus to enable them to market red bait adhering to the abalone shells. However, the total reported for 1992 was a low 36 kg. From the Saldanha area red bait is harvested as a by-product of mussel farming and 573 kg were produced. This is far lower than the 1991 figure of 2 275 kg.



A white sand mussel *Donax serra* digs into the sandy beach and extends its siphons

3.4 Mussel farming

PRODUCTION of the introduced black mussel *Mytilus galloprovincialis* in the Saldanha Bay area by four producers continues to expand, although production in the Port Elizabeth area has ceased because of a shift in emphasis to oyster culture. Most of the mussels are sold frozen to the catering market, 30% being smoked and canned and less than 2% sold fresh. Production for 1992 was 2 163 t, compared with 1 962 t in 1991.

3.5 Oysters

THE number of "wild" oysters *Striostrea margaritacea* collected from the intertidal zone along the Cape south coast by "pickers" continued to decline, to less than half a million in 1992 (Table V). The number of permits issued to pickers fluctuates annually but totalled 154 in 1992. Some of the pickers had permits for more than one area so that the number of individual pickers totalled 108. Production of cultivated oyster *Crassostrea gigas*, which are reared from imported spat, at 4,2 million was about on par with the 4,1 million for each of the previous two years. The recent entrant at Walvis Bay expanded output considerably in 1992,

to more than half a million oysters, so compensating for a lower yield, particularly at Knysna (Table V).

3.6 Abalone

ANNUAL landings per diver-hour, as well as indices derived from size composition data for each of the fishing zones provide the baseline information on which the fishery is managed. Catch and catch per unit effort (*cpue*) for each zone are shown in (Table VI) for the past two seasons, and in Figure 2 trends in *cpue* from 1986/87 to 1991/92 for the most important zones, A to D, are presented.

Figure 2 shows that the catch rates in Zones A and B appear to be improving, providing divers with better returns per hour underwater. The *cpue* in Zone C remains the lowest and Zone D may be stabilizing at a higher level. The catch rates from Robben Island (Zone F), were there is still a high proportion of old accumulated stocks, continue to fluctuate at a high level. Zone E, like Zone G, has been closed because of declining stocks, also apparently due to recruitment problems, and both these grounds will be reserved for recreational use.

In general therefore the industry based on the traditional fishing grounds between Cape Hangklip and Cape Point, appears to be continuing the trend of overall stability or improvement which has been in evidence

Table V: Commercial oyster production and marketers

Locality/Product	Number of size oysters		Number of marketers* 1992
	1991	1992	
Natural picked	507 655	495 148	12
Marketable "wash–ups"	10 587	16 018	1
Subtotal	518 242	511 166	13
Cultivated			
Walvis Bay	106 000	549 685	1
Saldanha Bay	493 976	300 331	3
Knysna	2 005 230	1 631 190	2
Port Elizabeth†	1 475 212	1 671 193	3
Subtotal	4 080 418	4 152 399	9
Total	4 598 660	4 663 565	22

* Marketers involved in more than one concession area or activity were counted separately for each

† Includes fattened wash–ups. There were also 21 901 undersize wash–ups in 1992

Table VI: Catch and catch rate for the abalone fishing zones

Zone – Area	Catch (t)		Catch rate (kg·diver–h^{-1})	
	1990/91	1991/92	1990/91	1991/92
A Quoin Point – Pearly Beach	184	194	145	159
B Franskraal – De Kelders	138	145	137	146
C Hermanus – Hawston	160	139	102	113
D Kleinmond – Holbaai Point	50	56	126	125
E Cape Point – Mouille Point	7	–	68	–
F Robben Island	28	30	310	203
– Dyer Island	–	22	–	141
All zones	567	587	128	141

Table VII: Commercial production of abalone

Commodity (kg)	1990/91	1991/92
Canned pieces*	108 140	117 753
Other canned products*	–	6 647
Frozen pieces*	25 576	19 223
Frozen whole (in shell)	1 362	4 817
Fresh/Live (in shell)		1 618
Total	135 078	154 192

* To convert to whole mass, multiply canned pieces and products by 4 and frozen pieces by 3

since the early 1980s.

The *TACs* per zone for the 1991/92 and 1992/93 seasons are illustrated in Figure 3. These show that, as a result of the failure of the West Coast to produce sustainable yields, there is now a major dependence of the fishery on the traditional zones, A to D, east of Hangklip.

The receiving quota for the 1992/93 season (October 1992 to June 1993) was again based on recommendations initially submitted by the Sea Fisheries Research Institute to the Sea Fishery Advisory Committee. The sum of the *TACs* for Zones A to G was set at 605 t whole mass, a rise of 5 t due to a 5-t increase in Zone B, all other zones including Dyer Island remaining constant.

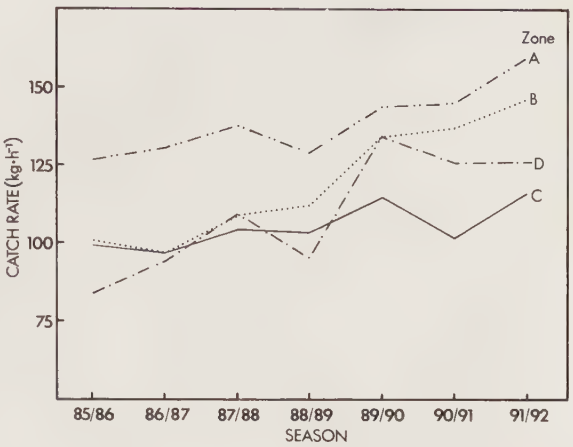


Fig. 2: Trends in catch per unit effort of abalone in the four main commercial diving zones, 1985/86–1991/92

The yield from similar quotas (595 and 600 t) was much better in 1991/92 than in 1990/91 (Table VII). Both the production of canned products and that of fresh or frozen whole abalone were higher. The total production of 154 t in 1991/92 amounts to some 578 t in terms of whole mass whereas the 135 t of the previous year represented some 511 t.

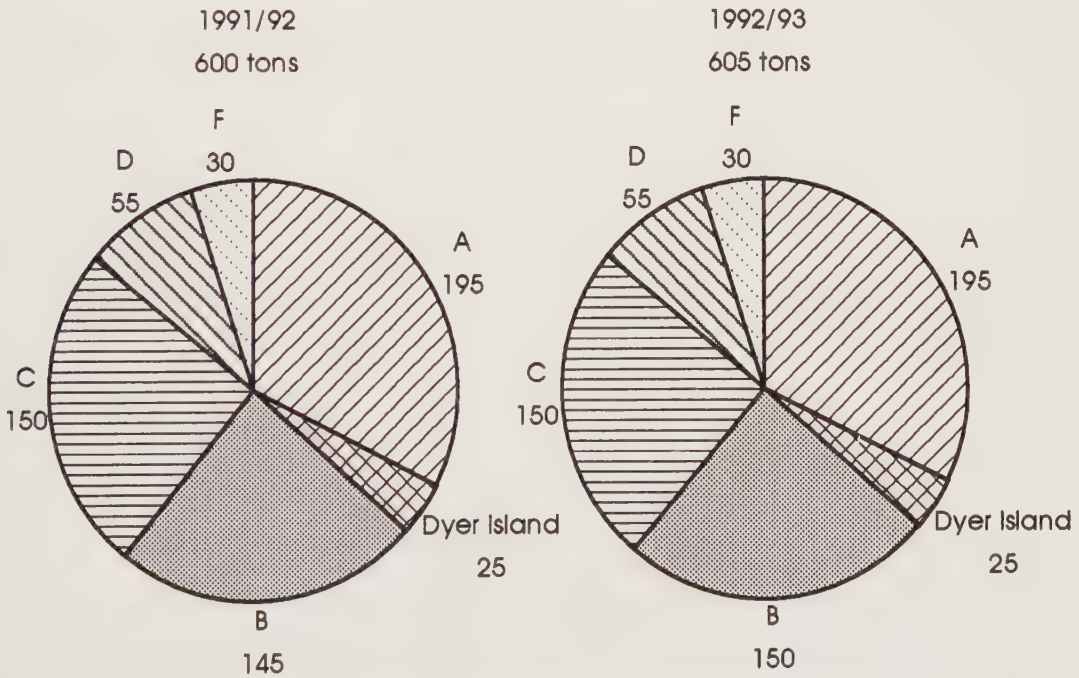


Fig. 3: Total Allowable Catches for abalone per commercial diving zone in the 1991/92 and 1992/93 seasons

3.7 Cephalopods

CEPHALOPOD landings consist of three groups of species, namely octopus, cuttlefish and squids. Squids provide the bulk of the catches, the size and value of which fluctuate considerably. The largest sector is the squid jigging fishery, which makes a large contribution to the total value of exported marine products, being one of the most lucrative resources.

The jig fishing fleet consists of about 300 mostly small vessels made up of ski-boats, catamarans and deckboats (Table VIII). The fishery is managed by means of a system of effort control measures, including limitations on the number of men deployed, a closed season during peak spawning and protection afforded by the Tsitsikamma National Park, which overlaps the spawning region. In addition, some 73 of these vessels are limited to Port Alfred, Knysna or False Bay, areas which have little influence on the overall catch. The duration of the 1992 closed season, based on a recommendation from the Squid Working Group, was three weeks.

After an excellent season in 1991, catches of chokka squid *Loligo vulgaris reynaudii*

Table VIII: Permits for jigging (C), processing (F) and transporting (X) squid granted to licensed South African commercial fishing vessels (1 December – 31 October) as at 10 November 1994*

Registration area	Registration letters	1990/91** (1 Dec.–25 Oct.)			1991/92 (1 Dec.–30 Oct.)		
		C	F†	X‡	C	F†	X‡
Saldanha Bay area	SBH	–	2 (2)	–	3	2	–
Vredenburg District (including Paternoster and St Helena Bay)	SH	2	1	–	3	2	–
Cape Town Harbour	CTA	5	30 (28)	–	5	31 (28)	–
Hout Bay	HTB	26	18 (2)	–	29	21 (1)	–
Kalk Bay	KB	51§	1	–	48§	1	–
Caledon and Hermanus Districts (including Hawston)	C	1	–	–	–	–	–
Gans Bay (including Klein Bay and Pearly Beach)	DDF	2	2	–	2	2	–
Bredasdorp District (including Waenhuiskrans and Struis Bay)	BR	1	–	–	–	–	–
Mossel Bay	MBA	2	1 (1)	–	4	1	–
George District	G	2	–	–	2	–	–
Knysna District (including Plettenberg Bay)	KN	14¶	–	1 (1)	16¶	–	1 (1)
Humansdorp District (including Jeffreys Bay and Oyster Bay)	H	108	1	15 (13)	114	–	21 (18)
Port Elizabeth area	PEA	64	15 (2)	5 (3)	62	18 (2)	5 (4)
Port Alfred District	P	29¶	–	–	31¶	–	–
Natal coast	N	4	–	–	6	–	–
Total		311§¶	74 (39)¶¶	21 (17)	326§¶	78 (31)	28 (23)

* It is a prerequisite to the granting of a C-permit that such vessels also have at least a linefishing permit

** Updated

† The first number is of vessels permitted to process squid, including those that also may fish; the figure in parentheses is of those with permits only to process but not to catch (so-called mother vessels)

‡ The first number is of vessels permitted to transport squid, including those that could fish during part of the season; the figure in parenthesis is of those that could only transport (so-called carrier vessels)

§ Includes 46 vessels in both seasons restricted to fishing for squid as bait in False Bay

¶ Includes 3 vessels from Knysna and 24 from Port Alfred in both seasons restricted to fishing for squid as bait in those two areas

¶¶ Includes 4 vessels only permitted to process that were not registered in a South African registration area

Spawning chokka squid *Loligo vulgaris reynaudii* hovering above their egg clumps on the sea floor in the Tsitsikamma National Park

declined in all sectors during 1992 (Table IX), reflecting the lower biomass levels detected on biomass surveys by the Sea Fisheries Research Institute. Large fluctuations in abundance and availability have been a feature of this resource since the start of the fishery in 1985 (Figure 4). In the short term this can be explained by the sporadic nature of inshore migration to the spawning grounds where the catches are made. There is, however, no direct evidence explaining interannual variability, but environmental factors such as weather conditions during the spawning season are suspected to be important and are the subject of ongoing research.

Table IX: Squid catches (t) by various sectors of the fishery

Sector	1991	1992
Foreign trawl	33	31
South African trawl		
Red squid	78	300
White squid	463	256
Subtotal S.A. trawl	541	556
Crustacean trawl	3	7
Jigging	6 624	2 588
Total all sectors	7 201	3 182

Trawled squid makes a small contribution to the total catches of chokka squid, but have been declining consistently since 1989. Only 256 t was taken in 1992, the lowest ever. This continued decline has taken place despite relatively high levels of abundance being measured at times during this period.

The reported catch of red squids (*Todaropsis eblanae* and *Todarodes angolensis*), in contrast, increased markedly over several

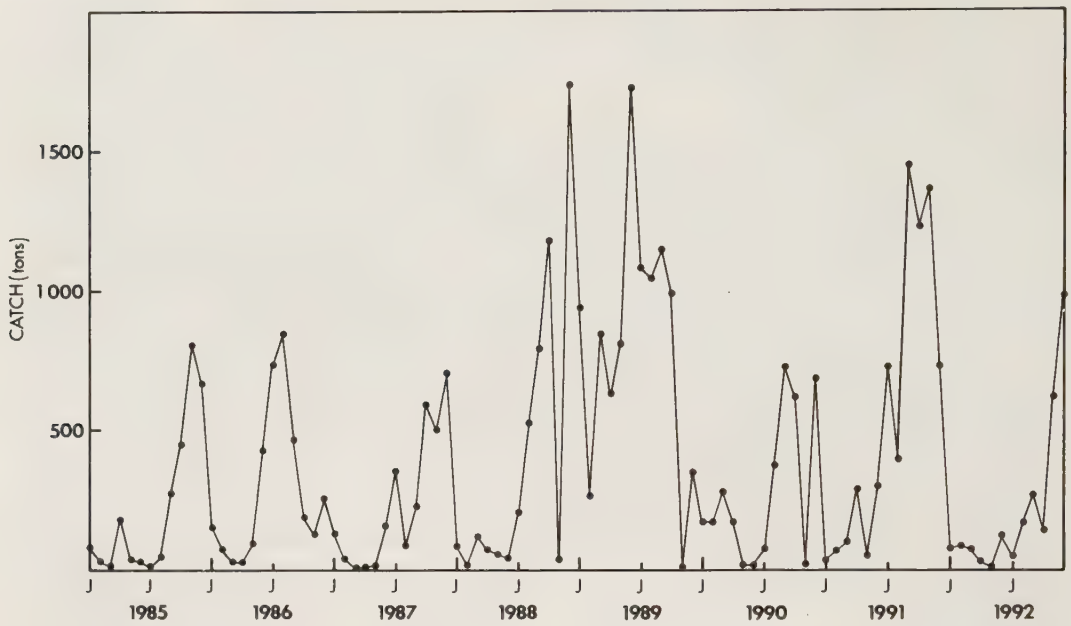
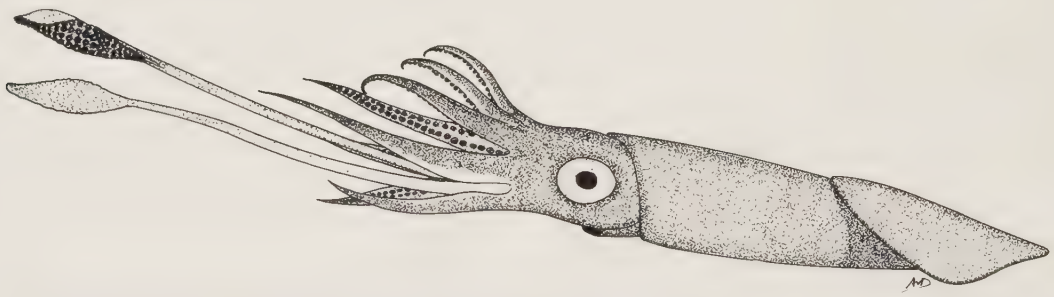


Fig. 4: Catches as indication of abundance and availability of chokka squid, 1985–1992

years' low levels suspected to be artificially low because of lack of a market and consequent dumping. In 1992 the declared trawl catch rose to 300 t from only 78 t in 1991 (Table IX).

The Indian squid (*Loligo duvauceli*) catch from the East Coast crustacean trawl fishery is small and fluctuates somewhat. It increased from 3 t in 1991 to 7,7 t (Table IX). Very little is known about the biology of this small species, which is common in the Indian Ocean.



The small Indian squid *Loligo duvauceli* of which small amounts are caught off Natal by the trawl fishery targeting crustaceans

Except for a small artisanal fishery for *Octopus vulgaris*, octopuses are not directly exploited, but are a by-catch of the trawl fisheries. In the deep-sea trawling sector, the landings were the highest yet recorded, 122 t, double that of 1991. The main species caught is the very large *O. magnificus*.

The octopus by-catch from the East Coast crustacean fishery (which is probably mainly *O. cyanea*) has declined slightly to 14,9 t from the previous year's 19,9 t (Table X).

The only reported commercial exploitation of cuttlefish (*Sepia* spp.) in southern Africa is a by-catch of the East Coast crustacean fishery. Landings increased from 4,7 last year to 9,8 t (Table X). Most of the catch originates from northern Natal waters, but the species composition is unknown.

Table X: Cephalopod catches (in kg) off Natal by the East Coast crustacean fishery

Species	1991	1992
Squid	3 043	7 334
Octopus	19 856	14 875
Cuttlefish	4 749	9 757
Total	27 648	31 966

3.8 Whelks and crabs

AN experimental permit was granted in April 1989. It was initially a crab (*Ovalipes trimaculata*) fishery with a whelk (*Bullia* spp.) by-catch but soon developed into a whelk fishery with a crab by-catch. Along the south-east coast from Cape Agulhas to Mossel Bay low densities were found which were not commercially viable. However, on the West Coast densities seem sufficient to sustain a small fishery. The experimental quota was set at 24 t for whelk and 8 t for crab, but landings have been much lower (Table XI). Typical fishing gear are rock-lobster hoopnets lined with fine-mesh netting and set on sandy areas in a depth of 5–8 m.

Table XI: Landings (kg) of crabs and whelks by ring nets

Year	Crab	Whelk
1989	683	3 740
1990	130	240
1991	49	2 183
1992	177	2 158

3.9 Crustaceans

3.9.1 WEST COAST ROCK LOBSTER

A *TAC* of 2 715 t was initially set for West Coast rock lobster for the 1991/92 season. This represented a 28% drop in *TAC* compared with the previous season and was the result of low lobster growth rates and poor performance by the fishery in the 1990/91 season. *TAC*s per area (each subject to a 7,5% tolerance) are shown in Table XII.

As a result of continued low lobster growth and the West Coast lobster industry's poor performance during the first part of the 1991/92 season, a reduction in the minimum size from 89 mm to 75 mm carapace length, with a *TAC* of 2 200 t, was introduced as a temporary relief measure in April 1992. The 1 583 t (Table XII) landed prior to 13 April 1992 (i.e. prior to the change in minimum size) represented 58% of original *TAC* and 64% of the total catch made in 1991/92. The bulk of the 900 t of lobster caught after the reduction of the size limit came from Zone C (St Helena Bay and Saldanha Bay), Dassen Island and Zone D (Cape Point). Meaningful comparison of catch rates in the 1991/92 season with those of previous seasons is not possible because of the change in minimum size.

The 20-t allocation as part of the Hout Bay culling experiment was caught over the period January–March 1992. Catch rates (3,96 kg·trap-haul $^{-1}$) doubled those of the 1990/91 season, but were still low compared to all other years over which the experiment has run.

As in the past fishing around Robben Island was poor and it proved uneconomical to try to catch the 50 t originally allocated to the culling experiment after only 9 t had been caught by April. The quota-holders were allowed to catch the remainder in areas where the *TAC* had not yet been filled, particularly Area 8.

Table XII: Actual catches of West Coast rock lobster in 1990/91 and 1991/92 and Total Allowable Catches (*TACs*) for the 1991/92 (before and after reduction of minimum size) and 1992/93 seasons per fishing zone. A = portion of 1991/92 catch landed before 12 April 1992 (i.e. before change in minimum size) and B = landings after 12 April 1992

Area	Number	Zone	Actual catch (t)				*TAC* (t whole)		
			1990/91	1991/92			1991/92 (minimum size 89 mm	1991/92 (minimum size 75 mm	1992/93 (minimum size 80 mm
				A	B	Total			
Port Nolloth	1	A	30	28	3	31	40	32	40
Hondeklip Bay	2	A	9						
Lambert's Bay	3	B	272	225	8	233	255	207	210
Elands Bay	4	B	238	260	20	280	223	181	260
St Helena Bay	5	C	686	363	242	605	641	519	456
Saldanha Bay	6	C							
Dassen Island	7	D	716	322	187	509	657	532	384
Cape Peninsula	8	D	785*	356	410	766*	799	648	760
Robben Island	9	D	–	9	–	9	50	41	20
Hout Bay/Oudeschip	10	D	20	20	–	20	20	16	40
False Bay	11	D	30	–	30	30	30	24	30
East of Hangklip			210	–	–	–	–	–	–
Total			2 996	1 583	900	2 483	2 715	2 200	2 200

* Includes catches made in deeper water south of Cape Point under special concession (150 t in 1990/91 and 200 t in 1991/1992)

For the 1992/93 season the minimum size was set at 80 mm carapace length and the *TAC* remained the same as the final allocation for 1991/92 (Table XII). However, the *TACs* for the central West Coast areas were reduced and those to the north and south of them raised.

Sales on the export and the local market for the 1990/91 and 1991/92 seasons are presented in Table XIII. The greater importance of the whole frozen product noted in the

Table XIII: Sales of West Coast rock-lobster products

Commodity (kg as specified)	Export		Local		Total	
	1990/91	1991/92	1990/91	1991/92	1990/91	1991/92
Frozen tails*	148 748	112 518	59 765	23 980	208 513	136 498
Whole cooked, frozen	501 870	898 350	147 215	122 461	649 085	1 020 811
Whole raw, frozen	1 033 219	310 762	90 062	70 000	1 123 281	380 762
Live	324 705	207 870	207 136	133 776	531 841	341 646
Total	2 008 542	1 529 500	504 178	326 237	2 512 720	1 879 717

* To convert to whole mass divide by 0,3011

1990/91 season was not evident in 1991/92. As in the seasons previous to 1990/91, the whole cooked product dominated the trade, whole frozen (raw) and live lobsters constituting the bulk of the remaining sales. However, the sales of tails are seen in better perspective if it is considered that 112 818 kg tails represent some 361 800 kg of whole rock lobster.

3.9.2 SOUTH COAST ROCK LOBSTER

THE production quota of 450 t tail mass remained unchanged and was once again caught in full in the 1991/92 season.

Discrepancies found in the statistics of catch per unit effort for South Coast lobster presented in previous reports were corrected and the revised series is presented in Figure 5. All previously published information on effort has been rejected as inaccurate and only the revised data presented in this report will be used in future.

The production of commodities from South Coast rock lobster in 1991/92 indicated a continued trend away from frozen tails towards the whole raw frozen and live product (Table XIV). Frozen whole cooked lobster was introduced as a South Coast lobster commodity for the first time in 1991/92.

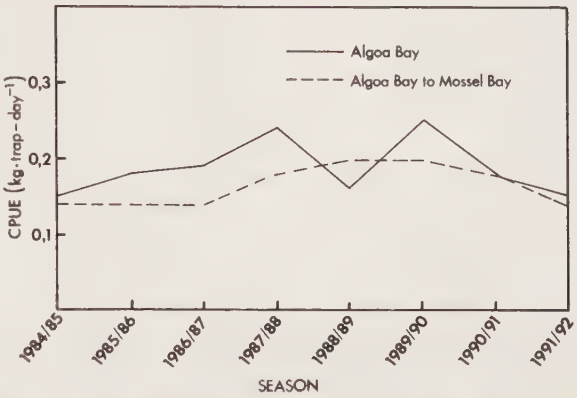


Fig. 5: Time series of catch per unit effort for South Coast rock lobster in the two main fishing areas, 1984/85–1991/92

Table XIV: Production of South Coast rock–lobster commodities

Commodity (kg as specified)	1990/91	1991/92
Frozen tails	321 762	259 855
Whole raw, frozen*	136 662	223 630
Whole cooked, frozen*		2 212
Live*	117 056	139 093
Total	575 480	624 790

* To convert whole mass to tail mass, multiply by 0,465

3.9.3 EAST COAST CRUSTACEANS

THE same number of permits was issued and utilized for prawn trawling with fine-meshed nets of 38 mm stretched mesh (in the cod-end) in Natal waters for 1992 as for 1991, namely eight. Of these vessels, five were allowed to fish within 7 nautical miles of the coast, but the remaining three had to keep outside that limit.

As in the past, landings for the various species fluctuated quite substantially between years (Table XV). The lower landings for inshore prawns are believed to be due to the drought conditions and the negative effect that they have presumably had on the prawn estuarine nursery habitats along the Natal coast. Langoustine and rock-lobster catches, by comparison, improved in 1992. The improvement is due (according to industry sources) to more effort having being put into understanding the geography of the trawling grounds, the habitats of these two crustaceans, and to more sophisticated navigational technology. No explanation can be offered for the steep decline

Table XV: Landings (kg whole mass) in Natal of the East Coast crustacean trawl fishery

Species	1991	1992
Inshore prawns (Tugela)	98 359	86 825
Offshore prawns (pink)	246 133	111 726
Langoustine	50 978	70 427
Shrimps	520	6 369
East Coast deep-water rock lobster	18 000	30 723
Shovelnose rock lobster	396	255
Inshore crab (Tugela)	5 766	6 710
Offshore crab (Red)	185 902	186 848
Squids	3 043	7 334
Octopus	19 856	14 875
Cuttlefish	4 749	9 757
Fish	66 645	58 007
Total	700 347	589 856

in landings of pink prawn.

3.10 Pelagic fish

3.10.1 CATCH

THE total catch by the pelagic fleet in 1992 recovered to 452 705 t (Table XV1) after being below 300 000 t for two successive years. Anchovy have dominated pelagic catches for over two decades, and the recovery was due to an increase in the catch of this species from 150 560 t in 1991 to 347 752 t. The higher catch arose from a raised *TAC*. The initial 1992 *TAC* had been set at 270 000 t, following an estimate of anchovy spawner biomass of just under 1,7 million tons from the survey in November 1991, but after the recruitment survey in May 1992 had shown approximately average anchovy recruitment for the year it was raised to 350 000 t, including 2 000 t to some 20 quota-holders for human consumption awarded for the first time. Therefore, the major event driving the recovery in pelagic catches was the good anchovy recruitment of 1991 leading to the high biomass of November 1991.

Pilchard catches also increased, to 53 416 t on a final *TAC* of 52 000 t compared with 51 948 t on a *TAC* of 50 000 t in 1991. However, the increase was not based on an improvement in the biomass of the stocks, and the final catch exceeded the scientifically recommended *TAC* of 45 000 t by 19%. The 1992 pilchard season therefore represented a *de facto* departure from the previously applied $F_{status\ quo}$ policy. This policy attempted to encourage rebuilding of the pilchard stock by applying the level of fishing mortality exerted on the stock between 1987

Chub mackerel *Scomber japonicus*, a sought-after schooling table fish which is caught by handline, trawl and purse seine

Table XVI: Landings of pelagic fish at South-Western Cape factories and by bait boats in 1991 and 1992 (reported species composition adjusted by counts of fish samples by C.P.A. Fishery Control Officers)

Month	Anchovy		Pilchard		Horse mackerel		Chub mackerel		Round herring		Lanternfish		Other*		Total	
	ton	%	ton	%	ton	%	ton	%	ton	%	ton	%	ton	%	ton	%
January	28 041	8,1	747	1,4	46	2,3	10	2,7	43	0,1	1	0,2	31	2,8	28 919	6,4
February	11 826	3,4	5 752	10,8	325	16,5	110	29,7	21 665	45,7	220	33,5	237	21,5	40 135	8,9
March	13 387	3,8	6 290	11,8	230	11,7	26	7,0	16 559	34,9	27	4,1	414	37,5	36 933	8,2
April	68 919	19,8	4 868	9,1	44	2,2	143	38,6	6 913	14,6	2	0,3	79	7,2	80 968	17,9
May	58 748	16,9	3 913	7,3	60	3,0	12	3,2	939	2,0	381	58,1	34	3,1	64 087	14,2
June	35 302	10,2	9 753	18,3	132	6,7	6	1,6	288	0,6	-	-	54	4,9	45 535	10,1
July	44 553	12,8	5 171	9,7	183	9,3	28	7,6	288	0,6	-	-	85	7,7	50 308	11,1
August	56 695	16,3	8 166	15,3	593	30,1	32	8,6	626	1,3	-	-	139	12,6	66 251	14,6
September	25 537	7,3	5 815	10,9	245	12,5	3	0,8	92	0,2	25	3,8	10	0,9	31 727	7,0
October	4 740	1,4	1 448	2,7	110	5,6	-	-	19	0,0	-	-	6	0,5	6 323	1,4
November	2	-	496	0,9	-	-	-	-	8	0,0	-	-	-	-	506	0,1
December	2	-	997	1,9	-	-	-	-	-	-	-	-	14	1,3	1 013	0,2
Total (1992)	347 752	100,0	53 416	100,1	1 968	99,8	370	99,8	47 440	100,0	656	100,0	1 103	100,0	452 705	100,1
Percentage		76,8		11,8		0,4		0,1		10,5		0,1		0,2		99,9
Total (1991)	150 560		51 948		548		9 865		33 484		662		2 095		249 162	
Percentage		60,4		20,8		0,2		4,0		13,4		0,3		0,8		99,9

* Juvenile gurnard, mantis shrimps, snoek, buttersnoek, hake, jellies and ice but also small quantities of other species

and 1989, during which period the population multiplied considerably. The pilchard *TAC* in 1992 included 27 000 t for directed catches intended for canning and 4 000 t allocated to individual factories and boat-owners (used as frozen bait and cutlets for human consumption or diverted to factory production), the remainder being for by-catches in anchovy and experimental round-herring fishing.

The reason the catch was allowed to exceed the recommended *TAC* was that serious problems were experienced with pilchard by-catches in directed anchovy catches. The initial allocation to by-catch of the 1992 pilchard *TAC* was 14 000 t. However, with the pilchard by-catch running at 6% of anchovy catches and an anchovy *TAC* of 350 000 t, it was decided to grant the industry an additional 7 000 t of pilchard by-catch to enable them to take the full anchovy *TAC*.

Round herring again accounted for the third highest mass of all the species in pelagic catches and 47 440 t was caught, compared with 33 484 t the previous year. This species remains a desirable but elusive target. It is estimated that the population could sustain an average annual catch of at least 100 000 t, but very little, if any, progress has been made by the pelagic fishery in their attempts to develop reliable methods to ensure more consistent catches of the species.

The other species caught accounted for less than 1% of the total. Of these species, the only notable change was a substantial fall in mackerel catch from 9 865 t in 1991 to 370 t in 1992.

Table XVII: Pelagic fishing industry: production of South-Western Cape factories in 1991 and 1992

Month	Meal		Body oil		Canned									
					Anchovy		Pilchard		Horse mackerel		Round herring		Total	
	ton	%	ton	%	kg	%	kg	%	kg	%	kg	%	kg	%
January	370	0,7	29	0,3	–	–	514 760	3,0	–	–	–	–	514 760	2,8
February	9 200	8,9	1 041	11,8	64 291	7,2	1 450 607	9,5	14 504	35,4	286 971	50,0	1 816 373	10,8
March	8 141	7,9	1 095	12,4	158 648	17,9	2 427 955	15,8	22 077	53,9	194 961	34,0	2 803 641	16,7
April	18 913	18,3	1 561	17,7	157 588	17,8	1 221 413	8,0	–	–	83 734	14,6	1 462 735	8,7
May	14 535	14,0	1 636	18,5	95 436	10,8	1 247 380	8,1	4 415	10,8	–	–	1 347 231	8,0
June	9 393	9,1	887	10,0	43 788	4,9	2 275 268	14,8	–	–	–	–	2 319 056	13,8
July	12 493	12,1	478	5,4	31 928	3,6	1 131 313	7,4	–	–	–	–	1 163 241	6,9
August	15 458	14,9	605	6,8	–	–	1 448 657	9,4	–	–	–	–	1 448 657	8,6
September	7 036	6,8	264	3,0	34 135	3,8	2 845 438	18,6	–	–	–	–	2 879 573	17,1
October	1 255	1,2	139	1,6	98 396	11,1	929 966	6,1	–	–	8 187	1,4	1 036 549	6,2
November	45	0,0	–	–	–	–	240 065	1,6	–	–	–	–	240 065	1,4
December	92	0,1	–	–	–	–	55 163	0,4	–	–	–	–	55 163	0,3
Total (1992)	103 498	100,0	8 843	100,1	887 318	100,0	15 330 417	100,1	40 996	100,1	573 853	100,0	16 832 584	100,0
Percentage						5,3		91,1		0,2		3,4		100,0
Total (1991)	55 289		8 686		206 373		17 134 933		–		438 309		17 870 660*	
Percentage						1,2		95,9		0,0		2,5		100,1*

* Includes 91 045 kg of chub mackerel canned in April 1991 (0,5% of the total)

3.10.2 PRODUCTION

THE production figures for the pelagic industry reflect the size and condition of catches and, with the large increase in anchovy catch in 1992, the production of fish meal and oil should obviously show proportional increases. Hence, fish meal production in 1992 rose by 87% compared with the previous year to 103 498 t while 8 843 t of fish oil was produced, 2% higher than the previous year (Table XVII). The reduction factor for fish meal was the same as last year, namely 4,2 t of fish to produce a ton of meal. However, the oil production did not show the expected increase, and the oil:meal ratio of 8,5% compared with 15,7% the previous year indicated that the lower yield may have been due to a combination of smaller fish and poorer fish condition in 1992.

The increase in the pilchard catch was entirely due to a higher by-catch of smaller fish, and the canned pilchard production, arising from directed catches of larger fish by boats with refrigeration, fell from 17 135 t to 15 330 t in 1992. Marginally more round herring was canned in 1992 (573,9 t) and, at 887,3 t, more than four times the mass of canned anchovy as pet food was produced. However, these improvements did not make up for the decrease in canned pilchard during the year (Table XVII).

3.10.3 FISHING FLEET

DETAILS of the permits issued to pelagic purse-seiners have now been added to the boat licensing and permit computer system. In all, 136 permits were issued to 113 such vessels (Table XVIII). To vessels

Table XVIII: Permits issued to licensed South African privately owned (P2) and factory-owned (P3) vessels to purse-seine pelagic fish for factory processing, dead (M) and live (Z) bait and to catch anchovy for human consumption (P4) in 1992

Registration area*	Single permits						Double permits								Total boats	Total permits
	P2	P3	P4	M	Z	Subtotal	P2+P4	P2+M	P3+P4	P3+M	P3+Z	M+P4	Z+P4	Subtotal		
PNA	–	–	1	1	–	2	–	–	–	–	–	–	–	–	2	2
ADF	–	7	1	–	–	8	–	–	–	1	–	–	–	1	9	10
PQ	5†	5†	–	1	–	11	1	1	1	1	–	1	–	5	16	21
SBH	1	7	–	1	–	9	–	–	–	–	–	–	–	–	9	9
SH	2	17	–	1	–	20	–	–	2	1	2	3	–	8	29‡	39‡
CTA	–	1	1	3	2	7	–	–	–	1	–	–	1	2	9	11
HTB	–	7	–	4	3	14	–	–	–	–	–	1	–	1	15	16
STH	–	–	–	1	–	1	–	–	–	–	–	–	–	–	1	1
KB	–	–	–	4	–	4	–	–	–	–	–	–	–	–	4	4
C	–	–	–	–	–	–	–	–	–	–	–	1	–	1	1	2
DDF	6	1	–	1	–	8	2	–	–	–	–	–	–	2	10	12
KN	–	–	–	1	–	1	–	–	–	–	–	–	–	–	1	1
PEA	–	–	1	3	2	6	–	–	–	1	–	–	–	1	7	8
Total boats	14†	45†	4	21	7	91	3	1	3	5	2	6	1	21	113‡	
Total permits	14	45	4	21	7	91	6	2	6	10	4	12	2	42		136‡

* Codes for registration areas are explained in Table III or Table XIX

† *Atlantic Pioneer* (PQ 97) was sold by its private owner to the factory it delivers to and counted as a factory boat only

‡ Includes one boat at SH that had three permits (for P3, P4 and M)

delivering to processing factories 74 permits were awarded for that purpose, 18 to privately owned vessels and 56 to factory-owned vessels. To purse-seine for "dead" bait there were 34 permits and a further 10 for live bait. A new permit type was introduced in 1992, namely to catch anchovy for human consumption, and 18 permits were granted. However, it is doubtful if many were utilized. Of the total, 91 vessels held permits for only a single purse-seining activity, besides any held for non-seining, 22 could participate in two purse-seining activities and one in three (Table XVIII).

The vessels permitted to purse-seine for live bait use their catch at sea to attract tuna and therefore do not submit catch statistics. Many of those allowed to catch pelagic fish as dead bait do not catch their allotted quotas themselves, but have them caught by other purse-seiners. The result was that in 1992 only 87 boats, including dead-bait boats, fished actively and submitted catch returns on which the catch statistics in Table XVI are based. This was six vessels fewer than the previous year. Two new vessels joined the fleet, both of which were less than 18 m in length. Of the eight vessels withdrawn, one was between 29 and 32 m, five were between 20 and 23 m and the remaining vessel was between 18 and 20 m in length. Excluding dead-bait boats, the fleet shrunk from 76 in 1991 to 70 in 1992. This decline in the pelagic fishing fleet continued the general decline since the 1950s when more than 200 vessels, on average, made up the fleet. However, the mean combined hold capacity of the fleet delivering to factories in the 1950s was 7 000 t and some 9 575 t in 1992 because larger vessels are nowadays used. The mean

vessel hold capacity in the 1950s was 35 t and is now 137 t (the range being 80–400 t and two-thirds of the fleet falling in the class 100–150 t). In terms of length, two-thirds of the factory fleet in 1992 were between 20 and 23 m. The great majority of bait boats were less than 20 m in length.

3.11 Linefish

DESPITE the fact that the number of linefish permits available for issue to commercial linefishermen was frozen at the end of 1985, the number of both full-time (A) and part-time (B) commercial linefish permits again increased from the 1991/92 permit year to the 1992/93 permit year (Table XIX). The number of B-permits issued rose by 1,5% to 2 663 and the number of A-permits by 3,1% to 528. This latter development is of concern, particularly considering that much of this increase was accompanied by a movement of A-permit vessels from the eastern Cape to Natal. This movement, resulting from reduced squid catches in the eastern Cape and good runs of kob and geelbek in Natal, led to a gain of 19,5% in A-permit vessels in Natal, placing more pressure on that province's already over-exploited reef fish populations. More information on the fishing fleet is given in Section 2.4. After 1985, when tuna linefishing permits were introduced, their numbers grew from 584 to 1 138 in 1990/91. Since then they have decreased to 1 104 in 1991/92 and 951 in 1992/93 (Table XIX). When licence renewal forms were posted to boat-owners for 1992/93 they were informed that new tuna permits would not be issued and that holders of commercial and semi-commercial linefishing permits did not need to take out a tuna permit to catch tuna. However, the permits of existing holders of such permits were renewed if they so wished. The decrease in the number of tuna permits is not thought to have affected full-time tuna fishers.

For the first time since the introduction of comprehensive linefish management regulations at the end of 1985, substantial changes were made to linefish management measures in 1992. These changes closely followed the recommendations of the South African Marine Linefish Management Association, the autonomous group recognized in terms of the Sea Fishery Act as the interest group representing the South African linefisheries. Changes were based on a complete revision of the linefish species management categories initially developed to allow tailored protection for groups of species under different degrees of exploitation pressure.

The original "Protected", "Regulated" and "Open" lists were replaced by "Critical", "Restricted", "Exploitable", "Recreational" and "Bait" lists. Each of these management categories was carefully defined, particularly the criteria required for allocating species to each list, with the objective of ensuring reasonable access to preferred target species by both recreational and commercial fishermen while increasing the protection of certain critical species. The Critical list, which has minimal bag limits, contains seriously threatened reef fish such as the poenskop, seventyfour, red steenbras and Natal wrasse, but also includes the recently protected great white shark. The Restricted list contains many of the species originally protected by bag limits, and it is this list that has bag limits for all but A-permit commercial fishermen. The original Open list was scrapped as it resulted in excess catches by recreational fishermen and violation of the prohibition on the sale of fish. It was replaced by the Exploitable and Bait lists, with only the Bait species now being unlimited for all fishermen. The Exploitable species include all the abundant commercial target species and are unlimited to A- and B-permit fishermen, but limited to 10 in total from that list per man per day for recreational fishermen. In return, prime recreational target species are now protected on the Recreational list, which has bag limits for all fishermen, including commercial fishermen, and prohibition of the sale of fish.

Table XIX: Permits issued to licensed South African commercial fishing vessels for commercial (A) and semi-commercial (B) linefishing and tuna (T) fishing (1 July to 30 June) as at 10 May 1993*

Registration area	Registration letters	Commercial (A)		Semi-commercial (B)		Tuna (T)	
		1991/92	1992/93	1991/92	1992/93	1991/92	1992/93
Walvis Bay	WB	1	7	–	–	1	2
Port Nolloth	PNA	1	–	34	36	1	3
Hondeklip Bay	HB	–	–	22	22	–	–
Vredendal District (including Doring Bay)	VR	–	–	121	123	–	–
Lambert's Bay	ADF	–	–	260	255	11	10
Piketberg District (including Elands Bay and Velddrif)	PQ	–	1	260	260	9	6
Saldanha Bay area	SBH	1	1	149	149	38	28
Vredenburg District (including Paternoster and St Helena Bay)	SH	1	1	217	223	44	41
Table Bay area (including Bok Bay and Yzerfontein)	CT	8	7	197	198	114	89
Cape Town Harbour	CTA	2	2	112	114	123	124
Hout Bay	HTB	20	20	82	77	110	109
Simonstown Harbour	STH	4	3	18	18	10	10
Simonstown area (including Cape Point and False Bay areas)	ST	14	13	234	240	124	105
Kalk Bay	KB	42	43	27	27	38	35
Somerset West District (including Gordon's Bay)	SW	15	18	165	173	64	49
Caledon and Hermanus Districts (including Hawston)	C	2	2	102	111	12	8
Gans Bay (including Klein Bay and Pearly Beach)	DDF	42	40	77	72	15	12
Bredasdorp District (including Waenhuiskrans and Struis Bay)	BR	67	68	99	104	43	32
Heidelberg District (including Witsand and Infanta)	SM	3	2	23	24	4	2
Riversdale District (including Still Bay and Puntjie)	R	14	11	93	107	9	4
Mossel Bay	MBA	9	9	35	38	32	28
George District	G	2	2	6	8	3	3
Knysna District (including Plettenberg Bay)	KN	8	7	22	23	16	13
Humansdorp District (including Jeffreys Bay and Oyster Bay)	H	64	49	97	81	111	88
Port Elizabeth area	PEA	39	39	50	58	66	65
Port Alfred District	P	27	33	53	59	23	15
East London area	ELA	8	9	17	16	9	5
Durban area	DNA	4	7	17	19	10	7
Natal coast	N	114	134	22	28	64	58
Total		512	528	2 625	2 663	1 104	951

* Includes both single and double permits; for example a boat with an A-permit may also have a T-permit and other permits

These changes to the species lists have resulted in changes in the bags of fish available to various fishermen. The most significant developments are the protection of critical species from exploitation by A-permit fishermen, the placing of bag limits on recreational fishermen for all except bait species and the protection and de-commercialization of recreational target species.

A total of 2 880 registered commercial linefishing vessels in the Cape and Natal reported 88 249 days fished to the National Marine Linefish System database during the year. These vessels reported a total national catch of 12 300 t of linefish, excluding squid and tuna, during

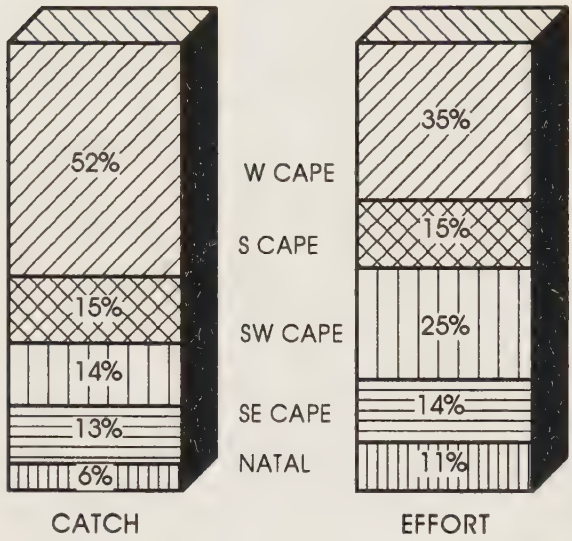


Fig. 6: Distribution of catches and effort around the coast for tuna, squid and fish caught on lines in 1992

1992, a decrease of 10% over 1991. Of this total, 11 270 t were reported in the Cape and 1 028 t in Natal. The distributions of catches on lines and fishing effort (including chokka squid and tuna) along the coast in 1992 are shown in Figure 6.

After last year's dramatic decline in tuna catch, as a result of the exclusion of South African tuna vessels from the Tripp Seamount fishing grounds off Namibia, the catch returned to its previous level. The by-catch of other species did not improve similarly, and the total reported catch of 5 215 t consisted of 98% albacore, with only 126 t of yellowfin, bigeye and skipjack tuna (Table XX). These fish were almost entirely caught on poles off the north-west Cape and Namibian coasts.

The lower Cape commercial catch resulted principally from a decrease of 14% in catches of snoek (Table XXI). This species again contributed 50% of the total Cape catch. Catches of the next two most important species, kob and carpenter, also declined significantly. In contrast, catches of yellowtail, geelbek and redfish species improved slightly. Catches of elf and mackerel decreased sharply following the very good runs in 1991, whereas greater targeting for export markets bettered the shark catch by 24%. The panga catch also rose markedly, partially offsetting the reduced carpenter catch.

Linefishermen continued to target on hake, although the line catch of this species dropped by 14% to only 1 090 t.

In Natal, the reported commercial catch improved by 14%, mainly as a result of better catches of kobs, geelbek, slinger and santer, the most important commercial species along the East Coast (Table XXII). Of the redfish species, catches of blueskin almost doubled while those of all other reef fish declined moderately. The annual runs of king and queen mackerel

Table XX: Commercial Cape and Natal catches (t) of tuna species reported per catch method

Method	Albacore		Yellowfin		Bigeye		Skipjack		Total	
	1991	1992	1991*	1992	1991	1992	1991*	1992	1991*	1992
Pole	2 669	5 035	36	63	85	51	16	5	2 806	5 154
Longline	–	–	–	–	–	–	1	–	1	–
Purse-seine	–	–	–	–	–	–	–	–	–	–
Rod and line	55	54	10	6	–	–	1	1	66	61
Trawl	–	–	–	–	–	–	–	–	–	–
Total	2 724	5 089	46	69	85	51	18	6	2 873	5 215

* Updated

were also less than in 1991, resulting in lower catches of these species.

An interesting development over the past few years has been exploratory longline fishing outside South Africa's fishing zone of 200 nautical miles by a few vessels. They have been fishing as far off as Walters Shoal off Natal, Mallory and Shackleton Seamounts off Agulhas, Erica, Protea and Schmitt-Ott Seamounts off Cape Point and Vema Seamount off Port Nolloth. Reported catches totalled 423 t in 1991 and 217 t in 1992, probably under-estimates, and consisted mainly of species such as Atlantic pomfret (*Brama brama*), Tristan bluefish (*Seriolella antarctica)*, Vema five-fingers (*Acantholatris vemae)* and wreckfish.

Half the reported Cape linefish catch was landed at the various fishing harbours from Port Nolloth to Still Bay (Table XXIII). The most important of these were the West Coast harbours from Port Nolloth to Kommetjie, particularly St Helena Bay and Yzerfontein, which received much of the snoek and hottentot catches. On the South Coast, most of the carpenter caught by larger vessels operating on the deep Agulhas Bank was off-loaded at Hermanus and a significant proportion of the kob at Still Bay.

Recreational fishermen reported just over 27 000 fishing days to the National Marine Linefish System during 1992 under a data collection contract with the Oceanographic Research Institute in Natal. The most important sources of data remained recreational skiboat cards (12 170 days fished, 15% more than reported in 1991), shore angling and light-tackle cards (about 6 400 days each) and shore patrols conducted by the Natal Parks Board (5 620 patrols). These data are thought to represent just over half of the recreational fishing effort in Natal and were used to produce catch summaries for that province.

Santer *Cheimerius nufar,* a linefish of which the availability on the East Coast is highly dependent on the movement of warm water masses

The total reported Natal recreational skiboat catch improved by 35% as a result of marked increases in many of the main target species (Table XXIV). For the first time in a number of years, there were good kob and geelbek runs on the Natal coast. Although exploited mainly by commercial fishermen, recreational fishermen also targeted these species, more than doubling their reported catches of 1991. Catches of most of the popular game fishes also improved, with good catches of king mackerel, queen mackerel, dolphinfish and tunas. Recreational fishermen also appear to be competing increasingly with commercial operators for the main reef-fish target species, slinger and santer. Reported recreational catches of these two species increased by 2,5 times and 3 times respectively.

3.12 Mullet and St Joseph

THE number of permit-holders of beach-operated nets decreased by one to 457 in 1992. Pursuant to a Ministerial decision in 1990, the total number of registered nets dropped further by 0,7% to 953 in 1992 (Table XXV). The registration areas for beach-operated nets around the coastline are shown in Figure 7.

Table XXI: Total reported Cape catch (to the nearest 100 kg) of linefish

Locality	Snoek	Yellowtail	Kob	Geelbek	Carpenter (Silverfish)	Roman	Red steenbras	Red stumpnose	Dageraad
Port Nolloth	15 200	700	–	–	–	–	–	–	–
Doring Bay	28 100	25 000	–	–	–	–	–	–	–
Lambert's Bay	185 400	–	–	–	–	–	–	–	–
Elands Bay	164 200	–	–	–	–	–	–	–	–
Laaiplek	17 800	–	100	–	–	–	–	–	–
St Helena Bay	1 830 400	2 200	–	–	–	–	–	–	–
Saldanha Bay	148 900	100	800	–	–	100	–	–	–
Yzerfontein	1 042 900	6 500	–	–	–	–	–	–	–
Cape Town	707 100	–	–	–	300	–	–	–	–
Hout Bay	409 200	1 100	–	–	–	–	–	–	–
Kommetjie	632 800	58 400	–	100	600	3 200	–	–	–
Kalk Bay	250 600	17 600	20 400	4 200	1 600	11 300	100	700	–
Gordon's Bay	65 900	12 100	102 900	40 600	11 700	14 700	500	2 200	–
Hermanus	51 200	200	6 200	13 100	11 500	2 400	100	100	–
Gans Bay	27 700	172 600	31 600	102 500	120 000	28 900	2 100	2 200	–
Struis Bay	24 600	240 800	13 900	83 500	59 300	21 000	11 100	2 200	–
Waenhuiskrans (Arniston)	1 600	17 000	63 000	42 500	172 700	11 600	37 700	1 100	200
Still Bay	700	500	308 700	4 100	5 400	11 400	700	1 000	1 300
Mossel Bay	1 400	200	89 400	2 300	50 400	6 800	600	500	800
Plettenberg Bay	7 500	3 300	9 400	13 900	76 900	8 200	3 300	6 000	2 100
Jeffreys Bay	–	300	10 000	4 600	105 800	4 100	3 300	3 000	8 200
Port Elizabeth	–	2 900	52 800	30 700	118 900	7 400	1 400	2 400	9 600
Port Alfred	–	100	97 800	16 100	112 100	5 400	11 000	2 000	11 800
East London	–	300	7 600	13 500	24 000	500	19 900	1 400	7 200
Total (1992)	5 617 200	566 900	822 600	371 700	871 200	137 000	91 800	24 800	41 400
Total (1991)*	6 524 600	535 300	976 600	349 500	1 209 200	113 500	125 600	18 000	31 600

* Updated
† Mainly baardman, blue hottentot, butterfish, flathead, Fransmadam, gurnard, horse mackerel, jacopever, kingklip, knifejaw,
‡ Includes 8 456 kg of steentjie in 1992 at Saldanha

Table XXII: Total reported catch (to the nearest 100 kg) of linefish species by

Locality	Kobs†	Geelbek	Slinger	Santer	Blueskin	Englishman	Scotsman	Emperor	Seventy-four
				*1991**					
Transkei	1 800	100	3 400	600	–	700	700	–	100
Southern Natal	46 400	99 100	115 800	22 800	17 100	53 400	12 400	1 400	4 600
Northern Natal	105 000	7 300	126 000	42 800	15 100	4 900	700	4 700	800
Total	153 200	106 500	245 200	66 200	32 200	59 000	13 800	6 100	5 500
				1992					
Transkei	8 300	5 600	4 600	1 000	–	1 300	1 100	–	200
Southern Natal	24 600	129 100	156 900	24 100	27 900	41 500	10 300	2 900	1 200
Northern Natal	134 800	21 500	147 200	45 700	35 500	8 200	500	1 200	500
Total	167 700	156 200	300 700	70 800	63 400	51 000	11 900	4 100	1 900

* Updated
† Includes kob and squaretail kob
‡ Includes dageraad, Dane, king soldierbream and red tjor–tjor (sand soldier)
§ Mainly blue hottentot, carpenter (silverfish), dolphinfish, German, grunter, kingfish, rubberlip, seacatfish (barbel), yellow-

species (tunas excluded) by registered commercial boats in 1991* and 1992

Santer	Hottentot	Chub mackerel	Sharks	Panga	White stumpnose	Elf	Hake	Kingklip	Other†	Total
–	200	–	500	–	–	–	3 400	1 200	1 600	22 800
–	4 700	–	700	–	–	–	5 900	1 500	2 700	68 600
–	10 900	–	–	–	–	–	–	–	–	196 300
–	1 000	–	–	–	–	–	–	–	400	165 600
–	12 700	–	3 200	–	700	–	–	–	1 000	35 500
–	49 500	–	5 900	–	300	–	13 900	1 400	1 400	1 905 000
–	21 000	–	4 800	–	31 400	300	1 700	–	9 200‡	218 300
–	79 900	–	400	–	100	–	8 900	1 800	300	1 140 800
–	47 000	–	9 800	300	100	–	–	–	1 100	765 700
–	7 200	–	100	–	–	–	51 000	6 800	4 000	475 400
–	127 600	400	6 200	1 200	300	–	25 500	–	3 000	859 300
–	31 500	200	26 500	10 300	69 700	7 600	–	–	15 900	484 200
–	32 400	2 100	2 300	14 900	20 300	26 500	–	–	12 500	361 600
–	4 100	100	17 800	1 500	–	–	4 700	–	300	113 300
–	59 400	1 400	241 500	400	5 000	1 900	300	–	7 000	804 500
600	700	1 500	24 300	300	–	1 500	10 400	–	7 000	502 900
14 100	–	–	24 700	–	–	–	5 300	200	2 300	394 000
14 600	–	700	58 100	900	200	300	6 800	–	4 400	419 800
3 000	–	1 000	24 000	700	–	500	123 700	2 600	2 100	310 000
400	–	10 500	4 300	17 200	100	1 500	679 400	29 500	4 900	878 400
600	–	13 000	2 200	60 500	–	200	44 200	400	2 200	270 800
9 000	–	2 800	700	20 600	–	500	96 200	400	3 000	364 500
16 100	–	200	1 000	116 000	–	–	9 600	–	7 300	406 500
900	–	100	–	20 100	–	–	200	–	12 200	107 500
59 700	489 800	34 000	459 000	272 900	128 200	40 800	1 091 100	45 800	105 800	11 271 700
31 300	521 800	161 200	370 500	186 800	130 700	63 100	1 271 100	90 700	104 100	12 815 200

rock-cod, seacatfish (barbel), steentjie and wreckfish

registered commercial boats fishing off Transkei and Natal in 1991* and 1992

Red steenbras	Unspecified redfish‡	King mackerel	Queen mackerel	Yellowtail	Poenskop (Black musselcracker)	Rock-cods	Other§	Total
				*1991**				
400	100	500	–	500	800	1 200	1 600	12 500
2 000	7 300	13 400	1 000	4 200	7 900	33 800	33 200	475 800
200	7 900	22 900	11 300	–	2 800	38 000	24 600	415 800
2 600	15 300	36 800	12 300	4 700	11 500	73 000	59 400	904 100
				1992				
300	100	100	–	100	1 000	1 900	2 100	27 700
900	5 100	5 500	200	3 000	6 400	30 900	39 700	510 200
300	5 900	16 800	2 200	–	2 200	44 400	23 800	490 700
1 500	11 100	22 400	2 400	3 100	9 600	77 200	45 600	1 028 600

tail fusilier (protea) and unspecified fish species

Table XXIII: Total reported Cape landings (to the nearest 100 kg) of linefish

Locality	Snoek	Yellowtail	Kob	Geelbek	Carpenter (Silverfish)	Roman, Red stumpnose, Santer	Red steenbras, Dageraad, 74
Port Nolloth	20 000	–	–	–	–	–	–
Doring Bay	16 700	–	–	–	–	–	–
Lambert's Bay	190 500	–	–	–	–	–	–
Elands Bay	37 800	–	–	–	–	–	–
Laaiplek	2 500	–	–	–	–	–	–
St Helena Bay	2 560 900	–	–	–	–	–	–
Saldanha	83 300	–	–	–	–	–	–
Yzerfontein	1 291 900	8 000	–	–	–	–	–
Hout Bay	111 100	–	–	–	–	–	–
Kommetjie	70 600	–	–	–	–	–	–
Kalk Bay	526 700	19 500	24 000	3 500	300	5 000	–
Gordon's Bay	40 100	4 100	20 200	9 500	2 900	5 600	–
Hermanus	200	4 100	1 600	11 600	104 500	500	5 100
Gans Bay	1 100	200	300	3 400	1 000	100	–
Waenhuiskrans (Arniston)	–	11 600	57 600	40 300	12 100	43 000	10 400
Still Bay	–	400	210 000	1 400	500	12 100	600
Total (1992)	4 970 700	40 200	314 600	69 700	121 300	66 800	24 800
Total (1991)	4 213 800	62 100	292 800	39 900	207 100	59 600	20 900

* Includes the same species as the Cape commercial catch summary (see Table XXI)

Table XXIV: Total reported catch (to the nearest 100 kg) of linefish

Locality	Kobs*	Geelbek	Slinger	Santer	Leervis	Green jobfish	Unspecified redfish†
			1991¶¶				
Southern Natal	300	–	200	100	–	–	–
Northern Natal	3 500	–	1 200	400	200	2 600	1 100
Total	3 800	–	1 400	500	200	2 600	1 100
			1992				
Southern Natal	–	–	200	100	–	–	–
Northern Natal	9 500	700	3 300	1 400	400	1 400	1 700
Total	9 500	700	3 500	1 500	400	1 400	1 700

* Includes kob, mini–kob and squaretail kob
† Includes dageraad, Dane, false Englishman, seventy–four and unspecified redfish species
‡ Includes black marlin, blue marlin, striped marlin and sailfish
§ Includes eastern little tuna, skipjack, yellowfin tuna and unspecified tunas
¶ Mainly blueskin, brindle bass, elf, Englishman, kingfish, musselcracker, poenskop, prodigal son, queenfish, Scotsman,
¶¶ Figures for 1991 updated

species at fishing harbours in 1991 and 1992 (excluding tuna)

Hottentot	Chub mackerel	Sharks	Panga	White stumpnose	Elf	Hake	Other*	Total
–	–	–	–	–	–	–	–	20 000
4 200	–	–	–	–	–	–	–	21 000
9 100	–	–	–	–	–	–	–	199 600
200	–	–	–	–	–	–	400	30 400
200	–	–	–	–	–	–	–	2 700
–	–	–	–	–	–	–	–	2 560 900
1 500	–	–	–	600	–	–	500	85 900
53 400	–	–	–	–	–	–	–	1 353 300
1 500	–	–	–	–	–	112 600		
20 300	–	13 500	2 100	20 000	–	–	700	99 600
35 600	–	–	2 400	3 700	3 200	–	6 000	641 200
6 300	–	500	–	–	4 200	–	3 400	118 700
1 000	–	7 700	–	–	–	–	–	129 100
1 400	–	–	–	–	–	–	–	15 200
–	–	25 000	–	–	–	–	–	200 000
–	200	47 600	400	100	100	4 300	1 800	280 600
131 800	200	95 100	4 900	24 100	7 500	4 300	13 600	5 907 200
166 600	400	50 700	3 300	5 500	3 300	22 900	5 700	5 239 200

species by recreational skiboats in Natal in 1991 and 1992

King mackerel	Queen mackerel	Rock-cods	Sharks	Dolphinfish	Billfish‡	Tunas§	Other¶	Total
				1991¶¶				
400	100	500	100	–	–	400	500	2 600
33 300	2 000	2 300	5 500	5 900	23 600	20 500	9 500	111 600
33 700	2 100	2 800	5 600	5 900	23 600	20 900	10 000	114 200
				1992				
400	–	200	–	–	–	100	400	1 400
45 400	6 300	6 400	3 600	12 600	21 400	21 400	13 400	153 200
45 800	6 300	6 600	3 600	12 600	21 400	21 400	13 800	154 600

snapper kob, stumpnose, wahoo and unspecified fish species

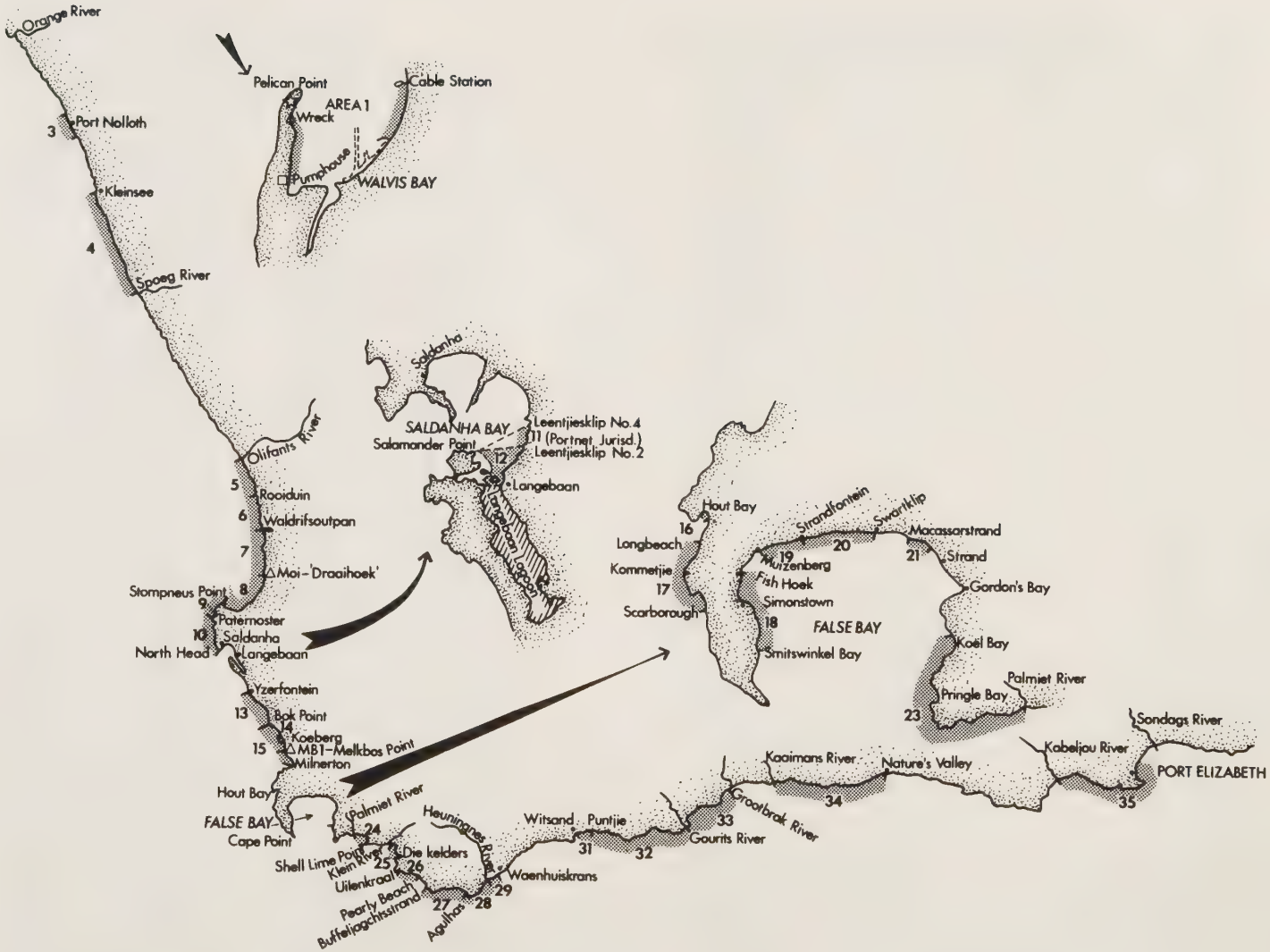


Fig. 7: Permitted fishing areas (1, 3–21, 23–29, 31–35) for mullet and St Joseph nets along the Cape coast, 1991–1992. Permit-holders have to conform with other permit conditions and requirements of local authorities within areas and obtain the permission of other state and private bodies to fish from beaches under their jurisdiction

Table XXV: Geographical distribution of beach–operated net permits, permit holders and mullet catches (as at 31 December)

Region	Number of permit holders		Registered drift and beach-seine nets		Number of mullet caught		Percentage of beach-seine catch	
	1991	1992	1991	1992	1991	1992	1991	1992
Orange River to Lambert's Bay	35	47	43	51	69 582	58 717	1,6	1,6
Elands Bay to Langebaan	310	305	714*	743*	2 434 015	1 958 780	57,0	52,7
Yzerfontein to Kommetjie	28	25	34	25	285 069	277 936	6,7	7,5
Simonstown to Kleinmond	16	22	28	23	1 168 578	1 005 178	27,4	27,1
Kleinmond to Cape Agulhas	32	27	40	32	152 336	282 267	3,6	7,6
Cape Agulhas to Still Bay	29	23	35	26	100 816	89 115	2,4	2,4
Mossel Bay to Buffels Bay	2	2	3	2	57 444	41 575	1,3	1,1
Port Elizabeth	1	–	1	–	–	–	–	–
Subtotal (Areas 3–35)	453	451	898†	902†	4 267 840	3 713 569	100,0	100,0
Walvis Bay (Area 1)	5	6	5	6	86 664	53 424		
Total (numbers)	458	457	903†	908†	4 354 504	3 766 992		
Total (kg mass)‡					1 088 626	941 751		

* Does not include 10 large–meshed shark gillnets held by one permit holder in the area Stompneus Point to Little Paternoster in 1991. No such permit for shark gillnets was issued in 1992

† Permits for drift nets allow holders to use either a small–meshed mullet drift net or a large–meshed St Joseph net with the same licence plate, thus theoretically doubling the 704 and 740 drift nets of those permit holders in 1991 and 1992 respectively; in fact only 45 large–meshed drift nets were in use in the area between Elands Bay and Langebaan in each year

‡ Mass is obtained by dividing number of fish by 4

The total catch of mullet (harder) dropped by 13,5% to 3,8 million fish (about 942 t). A 46,0% increase was reported in the stretch of coast between the Palmiet River mouth and Brandfontein (Areas 24–27), all other areas showing decreases ranging from 2,5 to 38,4%. Although the decline in the most productive area, that between Elands Bay and Langebaan, amounted to 19,5% that area still contributed 52% of the total mullet catch (Table XXV).

The total fishing effort was 10,6% lower and consequently caused a decrease of 28,6% in the by-catch to 265 t (Table XXVI). St Joseph sharks and yellowtail again dominated the by-catch and contributed 68 and 13% to it respectively.

3.13 Demersal fish

NO significant changes occurred in the demersal fisheries in 1992. At present the South African demersal fisheries can still be separated into discrete sectors. The deep-sea trawl

Table XXVI: Species other than mullet caught in drift, beach-seine and shark gillnets

Species	Catch (kg)	
	1991	1992
St Joseph (Elephantfish)	282 420	179 700
Soupfin shark (Vaalhaai)	9 365	7 591
Skates and Rays	80	18 939
Unspecified sharks	2 521	2 020
Baardman	1 933	349
Elf	3 424	1 670
Kob	2 879	4 578
Horse mackerel	950	201
Pilchard (Sardine)	100	3 352
Seacatfish (Barbel)	857	302
Strepie	715	174
White steenbras	995	10 816
White stumpnose	29	129
Yellowtail	38 174	33 698
Other fish*	771	1 028
Total	345 213	264 547

* Blacktail(dassie), garrick(leervis), grunter, gurnard, hottentot, musselcracker, sand steenbras, sole, springer (flathead mullet), steentjie, zebra and unspecified bony fish

fishery (based in the Western Cape) remains the largest, followed by the inshore fishery on the South Coast. Several smaller fisheries also exist. The midwater fishery directed at horse mackerel, although governed by separate permits and quotas, is closely linked to the deep-sea trawl sector. On the West Coast, permits were issued for the experimental exploitation of West Coast sole out of Port Nolloth and for a fishery in St Helena Bay targeting on gurnards.

The total South African catch for all species approximated 219 000 t and was only 1,9% lower than the previous year (Table XXVII). The hake catch rate continued to improve slowly, resulting in a further increase in the annual *TAC* for this species. Only three demersal resources were subject to quota control in 1992: the Cape hakes (144 000 t), Agulhas sole (872 t) and horse mackerel (45 000 t). The *TAC* for horse mackerel was sudivided for the first time in 1992. Japan was allocated 2 000 t, Ciskei 315 t and 685 t was kept in reserve for possible by-catches by Taiwan. The South African midwater fishery received 22 000 t sub-divided among 11 quota-holders, the deep-sea sector 16 700 t and the inshore sector 3 300 t. Management of the South African demersal fisheries is becoming increasingly complex as greater effort is exerted on species other than those controlled by quota.

3.13.1 DEEP-SEA TRAWL

THE deep-sea sector caught 84% of the total reported demersal catch in 1992 (Table XXVIII). Bottom trawling directed at hake remained the main objective of the fishery, although increasing effort was expended on other species.

Fishing effort was expended around the whole South African coast, although there were seasonal and areal trends. Most of the effort on hake was concentrated on the West Coast, where the best catch rates were obtained. Deep-sea vessels are restricted to a net with 110 mm stretched mesh on the West Coast, but are permitted to use nets of 75-mm mesh east of 20°E but not to trawl inside the 110-m depth contour (to control effort in general and reduce it specifically on sole).

In 1992, increasing effort was directed at the South Coast, where approximately 38% of the total hake catch was taken (Table XXVII). The time series of hake catches (Fig. 8) illustrates the relative contribution of the South Coast fishery to the total tonnage of hake caught. In 1992, total hake landings by all fisheries (including lines) approximated 139 000 t, somewhat lower than the 144 000 t *TAC* allocation. Because of a revision of hake *TAC* in mid 1992, additional quota was issued in November. Vessels were subsequently allowed to catch the balance of their 1992 allocations in early 1993. Although catches of hake continued to improve, the rate of recovery since the over-exploitation in the early 1970s has been slow. With the number of hake quota holders increasing, as well as the

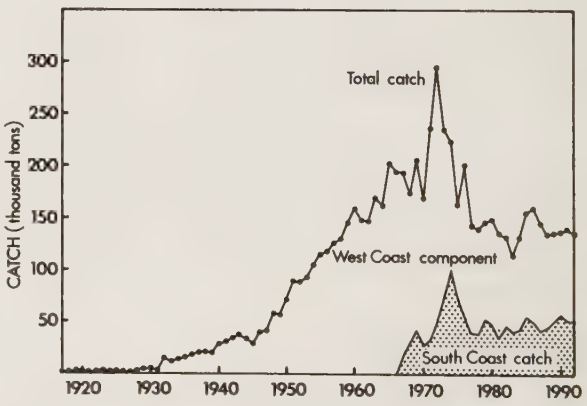


Fig. 8: Time series of commercial hake catches by all types of fishing gear and all countries on the South African west (1932–1992) and south (1966–1992) coast

likelihood of other hake-directed operations developing (such as hake-directed line-fishing), exploitation pressure on the resource will undoubtedly grow.

Kingklip catches in the trawl fishery showed signs of recovery since the sharp decline in the resource at the time of the longline exploitation between 1983 and 1990 (Fig. 9). Catches in 1992 were higher than in 1990 and 1991. The catch was, however, still but a small proportion of the total demersal landings (1%), compared with the years preceding longlining when the kingklip catch approximated 2–3% of the demersal catches.

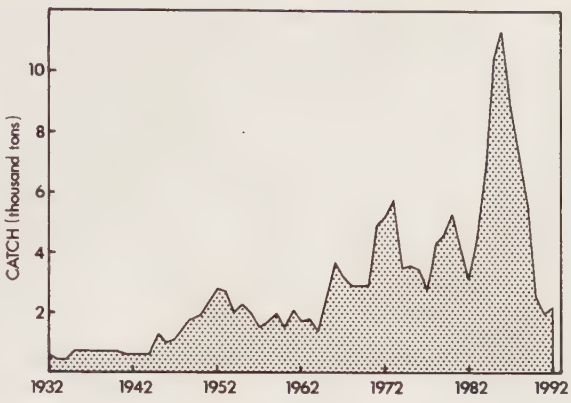


Fig. 9: Time series of commercial kingklip catches by all types of gear and all countries off the South African coast, 1932–1992

Horse mackerel remained a major component of the deep-sea catch, although in 1992 they were less available than in 1991 (Table XXVII). The popular by-catches of snoek and monk were both somewhat lower than in 1991. The buttersnoek (ribbonfish) catch increased (Table XXVII), suggesting greater targeting on this species.

3.13.2 INSHORE TRAWL

THE inshore trawl fishery is the second largest trawling sector, taking some 8,1% of the total demersal landings (Table XXVIII). The fishery extends along the Cape south and east coast with trawlers based at Mossel Bay (29), Port Elizabeth (7), Hermanus (3) and Gans Bay (1). In contrast to the deep-sea fleet, which uses wetfish and freezer stern trawlers, the inshore fishery comprises mostly small side trawlers varying in length between 15 and 30 m. The size parameters of inshore vessels are limited by the industry for the purpose of controlling fishing effort. The inshore trawling fleet works on the greater Agulhas Bank in water depths up to 130 m whereas the deep-sea fleet is restricted by permit from trawling shallower than 110 m east of Cape Agulhas.

In 1992, compared to recent years, there was no significant change in the catch trends of the inshore fishery and the sector, consisting of 11 companies, continues to be regarded as stable. A total catch of 17 849 t was landed in 1992 (75% in Mossel Bay) in comparison with the annual mean of 15 592 t (1986–1991). The Agulhas sole catch (697 t) was below the *TAC* of 872 t and the mean for the previous six years (818 t). This is attributed partly to a concerted effort made by the industry to avoid areas of high juvenile sole abundance and partly to problems experienced with the maintenance of the ageing vessels. The hake allocation for 1992 was 10 129 t (295 t more than in 1991), 9 162 t being landed and representing 51% of the total inshore catch.

In 1992 the horse-mackerel *TAC* was split and allocated per trawling sector for the first time, 3 300 t being reserved for the inshore fishery. The availability of horse mackerel in the inshore area varies annually, resulting in substantial fluctuations in the landings. In 1992, 4 939 t were landed, some 2 000 t more than in 1991. The by-catch of the inshore fishery directed at hake, sole and horse mackerel is an important component as shown in Table XXVIII. The landings of by-catch species such as kob, panga, gurnards, squid and skate have remained at similar

Table XXVII: Nominal (live) mass of bottom- and midwater-trawled fish, cephalopods and crustaceans landed in South Africa for South African quota-holders

Species	1991		1992*			
			West Coast	South Coast	Total	
	tons	%	tons	tons	tons	%
Cape hakes	135 223	60,6	84 014	51 165	135 179†	61,8
Kingklip	1 964	0,9	1 252	972	2 224	1,0
Soles	738	0,3	134	700	834	0,4
Kob (Kabeljou)	183	0,1	0	153	153	0,1
Panga	461	0,2	9	572	581	0,3
Other reds	92	0,0	9	32	41	0,0
Carpenter (Silverfish)	15	0,01	1	6	7	0,0
Pomfret (Angelfish)	773	0,3	662	206	868	0,4
Gurnards	633	0,3	271	405	676	0,3
Jacopevers	1 019	0,5	873	356	1 229	0,6
John Dory	895	0,4	672	431	1 103	0,5
Horse mackerel	35 015	15,7	4 242	27 467	31 709	14,5
Skates	1 268	0,6	28	1 244	1 272	0,6
White stumpnose	12	0,01	0	6	6	0,0
Snoek	15 607	7,0	8 995	3 874	12 869	5,9
Monk	5 884	2,6	3 860	998	4 858	2,2
Sharks and St Joseph	447	0,2	152	405	557	0,3
Chub mackerel	3 509	1,6	443	3 696	4 139	1,9
Buttersnoek (Ribbonfish)	12 147	5,4	6 109	8 118	14 227	6,5
Southern rover (Bonnetmouth, Red mullet)	583	0,3	285	133	418	0,2
Red squid	78	0,01	247	53	300	0,1
White squid	463	0,2	8	248	256	0,1
Octopus	62	0,01	93	29	122	0,1
Pilchard	63	0,01	2	24	26	0,0
Other	727	0,3	53	188	241	0,1
Subtotal	217 861	97,5 97,7	112 414	101 481	213 895	97,9 97,7
Offal (trash fish)	4 432	2,0			4 381	2,0
Subtotal	222 293	99,7			218 276	99,7
Natal: Crustaceans	606	0,3			500	0,2
Cephalopods	28	0,0			32	0,0
Finfish	67	0,0			58	0,0
Total	222 994	100,0			218 866	99,9

* Masses of 2 942 t of heads and 535 t of roes (mainly hake) were landed in 1992, but they form part of the live-mass value and have not been added in again

† Does not include 4 732 t landed in early 1993 that was held against the 1992 allocations nor 1 091 t caught on "lines"

levels and contribute to the overall landed value. In recent years, with the building of new factories at Port Elizabeth (in 1991) and Mossel Bay and upgraded production facilities, the utilization and value-added processing of the by-catch have improved.

3.13.3 MIDWATER TRAWL

COMPARED to the bottom trawl fisheries, the midwater trawl fishery is relatively small. In 1992,

Table XXVIII: Nominal (live) mass of fish landed (t) in different trawling sectors in South Africa in 1992

Species	Deepsea	Inshore (South Coast)	Midwater	Foreign	West Coast sole	West Coast gurnard	Total
Hakes	125 100	9 162	905	2 721	9	3	137 900*
Kingklip	2 014	177	10	60	23	1	2 285
Soles	3	697	–	–	134	†	834
Kob (Kabeljou)	–	153	–	–	–	–	153
Panga	106	448	27	697	–	–	1 278
Other reds	38	3	–	–	–	–	41
Carpenter (Silverfish)	2	5	–	–	–	–	7
Pomfret (Angelfish)	867	–	1	–	–	–	868
Gurnards	294	219	14	–	72	77	676
Jacopever	1 212	–	17	–	–	–	1 229
John Dory	1 056	5	41	–	1	–	1 103
Horse mackerel	18 336	4 939	8 427	2 006	7	–	33 715
Skates	18	1 238	–	–	16	–	1 272
White stumpnose	†	6	–	–	–	–	6
Snoek	12 427	2	440	–	–	–	12 869
Monk	4 724	86	46	153	2	–	5 011
Sharks and St Joseph	63	420	–	–	74	†	557
Mackerel	3 882	5	252	–	–	–	4 139
Buttersnoek (Ribbonfish)	13 671	12	544	–	–	–	14 227
Southern rover (Bonnetmouth, Red mullet)	406	–	12	–	–	–	418
Red squid	300	–	–	–	–	–	300
White squid	80	164	12	31	–	–	287
Octopus	120	1	1	–	–	–	122
Pilchard	11	–	15	–	–	–	26
Other	125	107	8	310	–	–	550
Subtotal	184 855	17 849	10 772	5 978	338	81	219 873
Percentage	84,1	8,1	4,9	2,7	0,2	<0,1	100,0
Offal (trash fish)							4 381
Total							224 254

* This figure for hake does not include 4 732 t landed in early 1993 that was held against the 1992 allocations nor 1 091 t caught on "lines"
† Less than 0,5 t landed

11 mid-water permits were issued (seven vessels fished), each of the nine major trawling companies participating in the fishery and targeting exclusively on horse mackerel.

About 87% of the midwater catch of horse mackerel was made on the South Coast, highest catches and catch rates being recorded on the eastern Agulhas Bank. The balance (13%) was taken in an area extending from Cape Agulhas westwards towards Danger Point.

Small amounts of other species were also caught by the midwater operations. These include other migratory semi-pelagic species such as snoek and chub mackerel, but also hake and buttersnoek (Table XXVIII).

The horse-mackerel catch with midwater gear (8 427 t) is still but a small part of the total demersal catch (33 715 t) for this species (Table XXVIII). Although horse mackerel are abundant on the South Coast, unpredictable horizontal migrations and diurnal vertical behaviour make them difficult to catch at times.

By far the largest catch of horse mackerel is made by the bottom trawlers, mostly as a

Table XXIX: Trawling quota allocations per species and catches (in t) of foreign countries in the South African fishing zone

Country	Quota										Catch		By-catch*	
	Hake		Horse mackerel		Panga		Squid		Total					
	1991	1992	1991	1992	1991	1992	1991	1992	1991	1992	1991	1992	1991	1992
Japan	400	500	4 000	2 000	1 000	1 100	–	–	5 400	3 600	4 240	2 908	288	173
Portugal	1 500	1 200	–	–	–	–	–	–	1 500	1 200	1 497	1 211	65	279
Spain	1 000	–	–	–	–	–	–	–	1 000	–	997	–	47	–
Taiwan	1 000	1 200	2 000	–	–	–	100	–	3 100	1 200	1 360	1 306	93	103
Subtotal	3 900	2 900	6 000	2 000	1 000	1 100	100	–	11 000	6 000	8 094	5 425	493	555
Moçambique†	750	1 000	–	–	–	–	–	–	750	1 000				
Total	4 650	3 900	6 000	2 000	1 000	1 100	100	–	11 750	7 000				

* A by-catch of 15 % was allowed to Japan and 25% to Taiwan and Portugal. Of the *TAC* for horse mackerel 685 t was reserved for possible by-catches by Taiwan

† This allocation was caught by South African quota-holders

by-catch. As a result, bottom and midwater trawling are often done alternately by the same vessel, depending on the availability of the resource.

3.13.4 WEST COAST EXPERIMENTAL SOLE AND GURNARD FISHERIES

TWO small experimental fisheries, for which separate permits are issued, operated on the West Coast. These operations are similar to that of the inshore fleet on the South Coast. Vessels are small and use nets of 75-mm mesh.

Two vessels operated out of Port Nolloth, targeting on the once abundant West Coast sole. The catch of sole was 134 t (Table XXVIII), nearly double that caught in 1991, but still only some 19% of the Agulhas sole catch (Table XXVII). Most of the effort was expended close inshore between the Orange River and Port Nolloth, with catches spread over most months of the year. Highest catches were recorded in February, March and July. There was a small by-catch (Table XXVIII) of hake, kingklip, gurnard, horse mackerel, skate and St Joseph.

Farther south, in the St Helena Bay area, three experimental trawling permits were issued in 1992. The target species was the Cape gurnard. In addition to gurnard, small quantities of hake, kingklip, sole and shark were also landed (Table XXVIII).

3.13.5 CATCHES BY FOREIGN COUNTRIES

CATCH quotas for foreign fleets were further reduced. The total quota allocated in 1992 was 7 000 t compared with 11 750 t in 1991 (Table XXIX) and included hake, horse-mackerel and panga allocations. The countries involved were Japan, Taiwan, Portugal and Mozambique and, with the exception of Japan, they filled their quotas for 1992. All countries recorded small by-catches that included kingklip, monk, white squid and shark.

3.13.6 DEMERSAL SPECIES AND STOCKS

NO major changes were noted in any of the main demersal resources in 1992. Good catches of hake were recorded throughout the year on all the traditional hake grounds. Most effort was directed in the

proximity of the home bases of the largest trawling companies. In keeping with a trend noticed in recent years, less effort was made on the northern section of the West Coast extending to the Orange River. The reasons for this are not clear, but it is probably the result of good availability of demersal species off the Western Cape and South Coast. Availability of hake varies seasonally, which often dictates the movements of the trawling fleet. Weather and sea conditions, as well as market-related requirements, also influence the time and areas fished. Although the West Coast has traditionally been the main target area for hake, increasing effort is being directed at the eastern and southern Agulhas Bank. The greater part of the West Coast hake catch was made by the deep-sea fleet in water deeper than 300 m, indicating that the deep-water hake species was mostly caught.

Of major concern is the growing pressure to exploit hake using lines. In excess of 1 000 t of hake was reported caught by handline operations on the western South Coast in 1992 (handline operators are restricted to a maximum of 10 hooks per line).

It is assumed that most of the inshore fleet's hake catch (9 262 t) on the South Coast is composed of the shallow-water species, while the bulk of the entire trawl catch on the South Coast is taken by the deepsea fleet, and is composed predominantly of the deep-water species. Given the potential changes to the fishery in that area, it is predicted that greater exploitation pressure will be put on the shallow-water hake. The debate on the advantages and disadvantages of trawling and linefishing for hake continued in 1992 and is certain to become a larger issue in coming years. For the time being, however, indications are that the hake resource is slowly improving under the present harvesting strategy but that the impact of the linefisheries will have to be carefully monitored.

Catches of Agulhas sole remained steady. Entrepreneurs in the inshore fishery target not only on sole, but also on hake and horse mackerel. Few boats target exclusively on sole. The highest sole catches in 1992 were in June, July and September in the Cape Infanta area. Good catches of large sole were also reported on the eastern Agulhas Bank in the Port Elizabeth area where larger fish are still available. Operators continued to make an effort to avoid areas where small sole are abundant. It appears that the controlled exploitation of the Agulhas sole is having no adverse effect on the stock.

The horse-mackerel stocks were abundant on the South Coast, but are a source of frustration to the industry. Availability was unpredictable and markets not fully established. For reasons already explained, horse mackerel is a difficult resource to assess. Using the best available information, scientists recommended that the total horse-mackerel catch should not exceed 45 000 t in 1992. A major consideration is the source of horse-mackerel recruitment. Bay areas on the South Coast are known to support large numbers of juvenile horse mackerel, and they are closed to trawling. More important, however, is the possible recruitment from the West Coast to the South Coast. Large numbers of juvenile horse mackerel were caught by the purse-seine fleets on the West Coast and this could have had a significant impact on the potential adult stock on the South Coast.

Other demersal stocks monitored closely included kingklip and gurnards. The kingklip resource was again difficult to assess since it is only caught as a small by-catch in the trawl fishery for hake. The species was not fished on its preferred grounds either (kingklip are found predominantly on hard or rocky grounds that are mostly inaccessible to the bottom trawl fleet). Nevertheless, the kingklip by-catch is used as an indicator of the state of the resource. Catches in 1991 and 1992 have increased slightly, suggesting that the resource is recovering.

However, it is too soon to confirm this with certainty. A further consideration is that any growth in a hake-directed linefishery will almost certainly impact on the kingklip resource in a similar, but perhaps less severe, way as the bottom longline experiment in the 1980s.

By-catch species are often neglected when assessing a targeted resource. Monk, for example, is an extremely valuable catch and in 1991 and 1992 approximately 5 000 t were landed. As more of the by-catch species are retained, the proportion of traditionally highly valued species in the catch, such as hake, will shrink. Buttersnoek (ribbonfish) were landed in large quantities (14 227 t in 1992), and the development of markets for this species has resulted in targeting. With the decreasing foreign effort, catches of panga have declined. Other by-catch species, such as red squids, are increasingly being retained by trawlers, whereas before they were normally discarded as trash fish. Once again this trend is thought to relate to the development of markets.

Monitoring and sampling of the demersal fisheries continued in 1992. Greater effort was made to sample the size distributions of the different fish size categories used by the industry. In addition, regular monthly sampling on board commercial trawlers was done and the results were compared with direct information obtained from three research biomass surveys conducted each year. The quality of the data used in resource assessment is dependent upon log books obtained from the skippers who report on their day-by-day catches. Their estimates are balanced against the total landings recorded for each vessel after each trip. The demersal data base and the quality of the information contained therein are essential for the control and management of the fishery, as well as for the correct and sustainable utilization of the resources. The potential growth in the hake fishery, with the possibility of a substantial linefishery for the species, will make maintenance of the data collection and capture system increasingly difficult. This is an ongoing task of those responsible for the demersal stocks within Sea Fisheries.

3.14 Seals

THERE was no seal harvest in 1992 because the moratorium on seal harvesting, first imposed by the Minister in 1990, has not yet been lifted. Further consideration of the sealing issue at Cabinet level awaits the completion of research recommended by the Hanks Committee (1990) and by the International Seal Workshop (1991). The Workshop recommended that a scientific report should be presented to the Minister by mid-1993.

The export of seal products in 1992 included the shipment of 6 080 skins to London and the sale of 15 live seals to four overseas zoos or aquaria.

3.15 Guano

IN 1992, 513 t of seabird guano was removed from Bird Rock Platform (Walvis Bay) and 2 t from Robben Island. Islands recently exploited but from which no guano was removed in 1992 included Mercury Island, Ichaboe Island, Seal and Penguin islands near Lüderitz, Bird Island at Lambert's Bay and Bird Island in Algoa Bay. At certain of these localities, concessions for the collection of guano in 1992 were not granted pending finalization of the plans for the management and utilization of the islands.

In Namibia, 264 t of guano was collected from the northern seabird platform in Cape Cross Lagoon. No collections were made from the platforms at the centre of Cape Cross Lagoon

Gannet guano being scraped on Bird Island, Lambert's Bay

and at Swakopmund. The reason for this was the depressed World economy and a consequent large slump in guano sales.

The overall harvest of seabird guano in southern Africa in 1992 amounted to 779 t. This is considerably less than the 3 346 t harvested in 1991, 3 497 t in 1990, 4 447 t in 1989 and 2 791 t in 1988.

3.16 Historical reviews of exploitation control

THE series of internal reports on the historical development of the various sectors of the fishing industry and other related events was extended. In addition to the reports listed last year, the following report was completed in Afrikaans, bringing the total to fourteen reports:

– Aspekte van die Bewaring en Ontginning van die Kaapse Pelsrob in Suid-Afrika (Fur seals).

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